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The AIRCRAFT ENGINEER AND AIRSHIPS

1550 XXXIV

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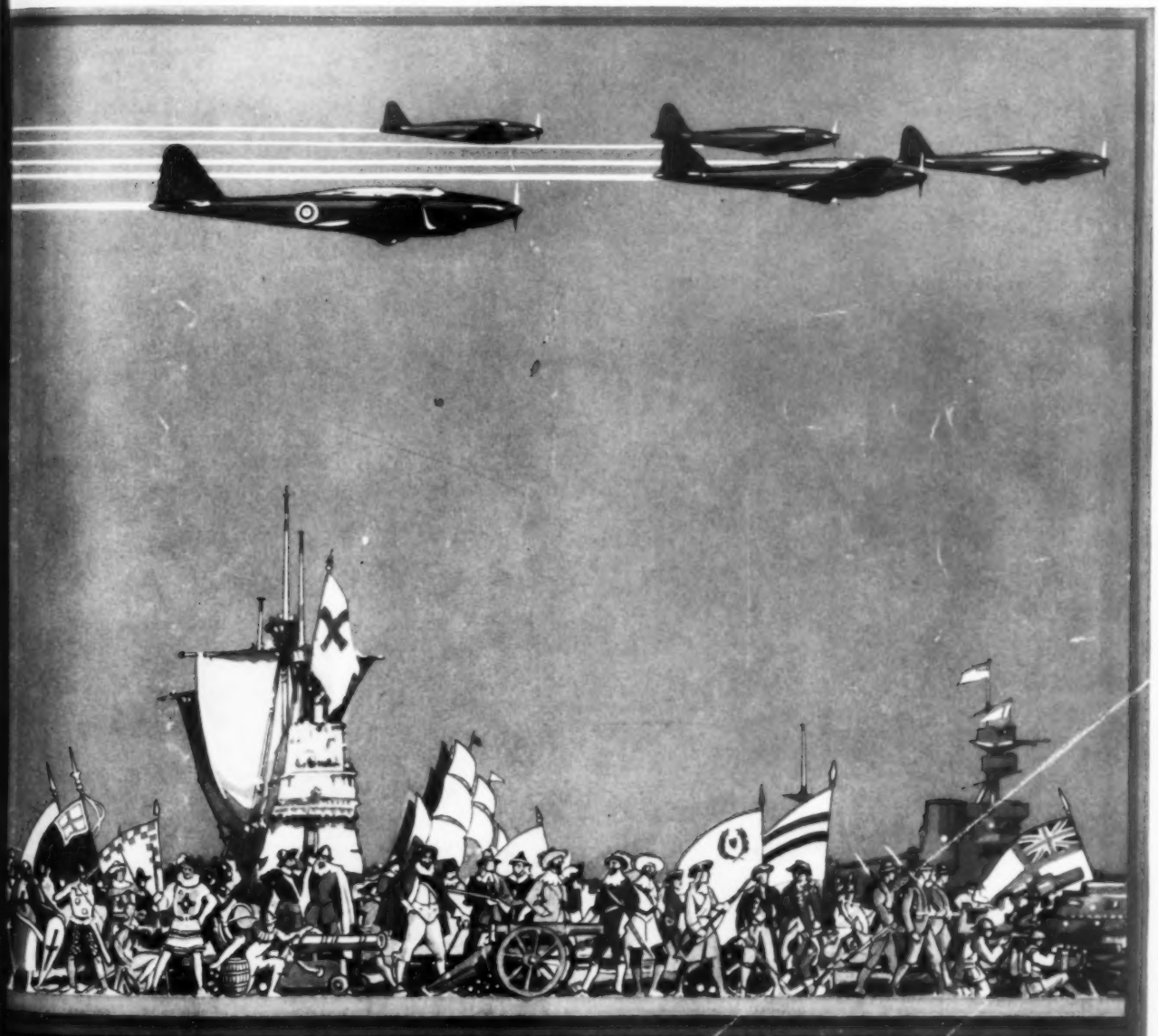

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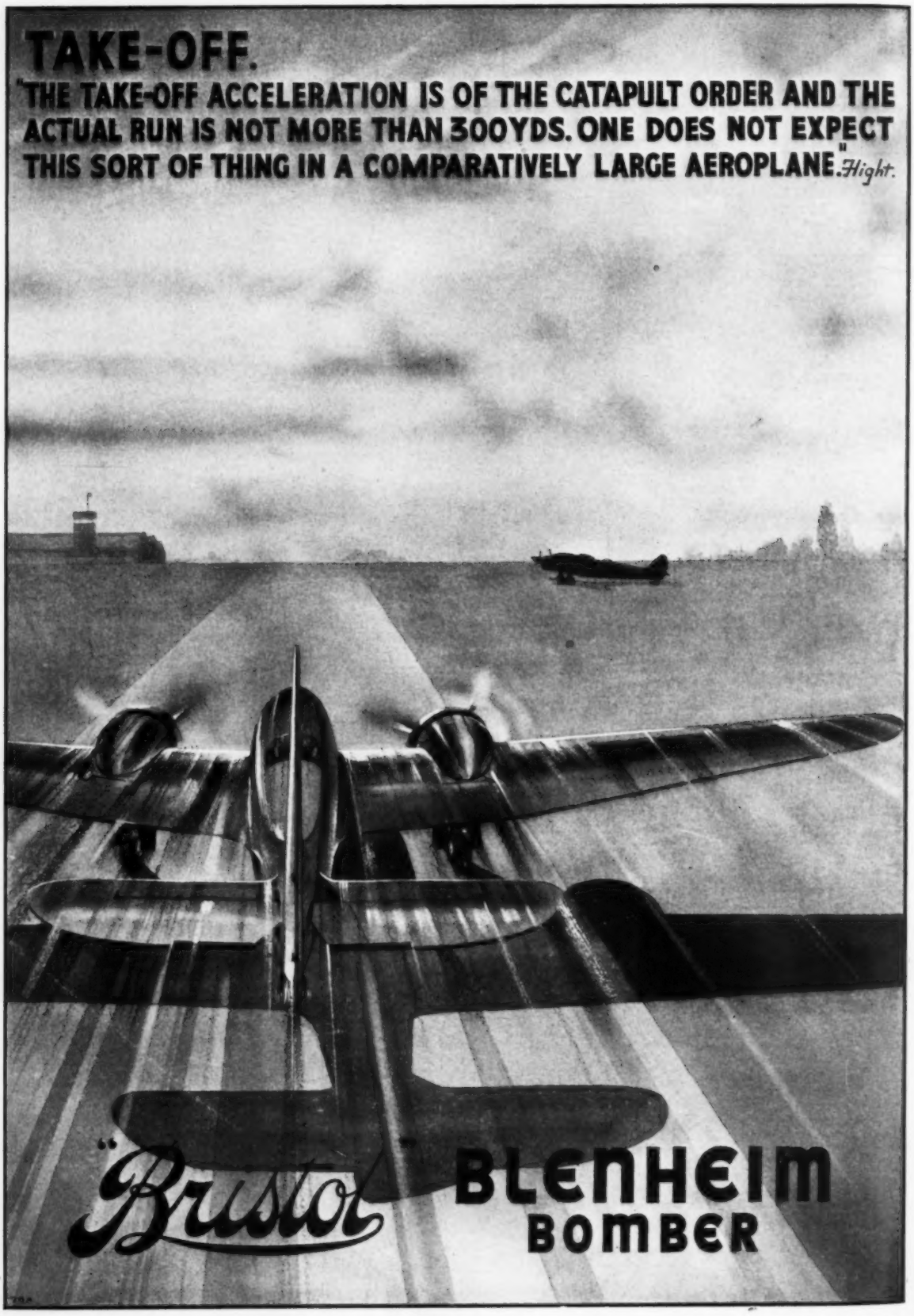
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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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Chief Photographer JOHN YOXALL

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1

Telegrams: Truditur, Sedist, London. Telephone: Waterloo 3333 (50 lines).

9-10, CORPORATION ST., COVENTRY. Telegrams: Autocar, Coventry. Telephone: Coventry 5210.

GUILDHALL BUILDINGS, NAVIGATION ST., BIRMINGHAM, 2. Telegrams: Autopress, Birmingham. Telephone: Midland 2971.

260, DEANSGATE, MANCHESTER, 3. Telegrams: Iliffe, Manchester. Telephone: Blackfriars 4412.

26B, RENFIELD ST., GLASGOW, C.2. Telegrams: Iliffe, Glasgow. Telephone: Central 4857.

SUBSCRIPTION RATES: Home and Canada, Year, £1 12 0, 6 months, 16s. 6d., 3 months, 8s. 6d. Other Countries, Year, £1 16 0, 6 months, 18s. 0d., 3 months, 9s. 0d.

No. 1550. Vol. XXXIV. SEPTEMBER 8th, 1938 Thursdays, Price 6d.

The Outlook

Canada's Contribution—

AFTER a relatively short period of discussions, the special British mission to Canada seems to have got results. Last Friday the mission issued a preliminary statement in which it was reported that arrangements had been made by the United Kingdom Government for the placing of contracts for bomber aircraft, and that the mission was also discussing with Canadian aircraft firms arrangements for placing contracts for the manufacture of other types of aircraft for the United Kingdom.

"Long-range" is the term used in connection with the first arrangement, and long-range it appears to be, both in the sense that it is being planned for operation over a long period of years, and also in relation to the type of aircraft to be manufactured, which will be bombers and, presumably, long-range bombers which could, if the need arose, be flown across from Canada if military equipment were omitted and extra tanks fitted instead.

Details have not been divulged, but it is to be assumed that the two new central factories which are to be established in Montreal and Toronto will manufacture complete aircraft of the bomber type, while the "other centres" to which the mission refers, at Vancouver and Fort William, will build other types of aircraft for the United Kingdom.

That all the Canadian firms capable of doing the work will be brought into the scheme may be assumed. But there is still some doubt about the exact manner in which their productive capacity will be utilised. The mission's statement is very ambiguously worded, and it is by no means clear whether existing Canadian companies will have a share in the new Montreal and Toronto factories, or whether these two factories are to be assembly plants, the bits and pieces being manufactured by the existing plants in different parts of Canada.

—and the Way of It

FROM experience in this country, the latter plan would not appear to be very probable. Our aero engine shadow factories are planned on the production of various components by different firms, the assembly and testing being done by one of them. As regards airframes, however, a different plan has been followed; each shadow factory produces complete aircraft, the assumption being that the assembly by one works of bits and pieces manufactured elsewhere is not practicable.

Actually, as things have worked out in practice, this assumption has been proved at least partly unfounded. Many, in fact most, aircraft firms have considerable quantities of aircraft components manufactured outside, by sub-contractors. If it is possible to do this satisfactorily, it should be possible to use existing Canadian factories for manufacturing components for the bombers and to let the new factories do the assembly.

How far that scheme can be carried depends very largely on the type of aircraft chosen. Certain types of construction resemble the Meccano principle in that assembly consists largely of bolting units together. If the units are large enough, and if jigging is sufficiently carefully done, the final assembly should not present insuperable difficulties.

In this country there is something to be said for building one type of aircraft completely in several factories. If an enemy bomb should play havoc with one factory, the complete flow of production of that type of aircraft would not be stopped. But Canada is assumed to be outside bombing range, so that such considerations need not apply. And greater production flow is likely to result from letting different firms specialise on certain parts, as we do in this country in connection with aero engines, than from several factories each building the same complete aircraft. Moreover, the latter plan necessitates multiplying the machine tools required for the manufacture of parts and is, therefore, somewhat wasteful.

Command of the R.A.A.F.

IT is some years now since the Commonwealth Government of Australia invited Sir John Salmond to inspect the Royal Australian Air Force and report on measures desirable for increasing its efficiency. The Commonwealth decided to adopt his report, but for various domestic reasons it was never implemented in full. Since then much water has flowed down the Murrumbidgee, and Australia is now acutely anxious to put all her defences in the best order. Sir Edward Ellington, Inspector-General of the Royal Air Force, has accordingly been asked to make an up-to-date report and recommendations for reorganisation of the

A WINNER, HANDS DOWN—or up, according to which way you look at it. Flt. Lt. Philip Lucas shows that our new monoplane fighters are by no means intractable. In this unique *Flight* photograph he has put the Hurricane on its back and removed both hands from the stick; one hand is hiding the other, but both were definitely raised—or lowered.

R.A.A.F., and it is stated that far-reaching results are likely to follow.

As a first step, Air Vice-Marshal Williams, who passed through the Staff College at Andover a few years ago, is likely to come to England for a refresher course. The R.A.F. has changed very much since he was last over here, and it seems only reasonable that he should come and make himself personally familiar with the latest developments. His absence will leave the air command in Australia temporarily vacant, and it is reported that an officer of the R.A.F. will be sent out at the invitation of the Commonwealth Government to take command of the R.A.A.F. No name has yet been mentioned, as Sir Edward Ellington is coming home to confer with the Air Ministry before making a recommendation.

This step is certainly surprising, and it evidently represents the recently awakened determination of the Commonwealth to let no consideration stand in the way of making its air defences as fit as possible to meet any demand which may be made upon them.

A Radio Reserve

EVERY branch of the R.A.F. ought to have a reserve on which it could draw to replace either casualties or ordinary wastage in time of war. Pilots and other members of aircraft crews obviously need first attention, as they would be most subject to war casualties, but ancillary services are subjected to great strain and long hours in time of war, and it is only right that the R.A.F. Volunteer Reserve should contain non-combatant branches. A good move was made last week by inviting civilian radio experts to train for incorporation in the Volunteer Reserve.

The tactics of air defence, and to some extent of air attack also, depend on rapidity of communications. In time of war the Fighter Command must never relax or go off duty. At any hour of day or night the Observer Corps may send in reports of approaching raids, and immediately steps must be taken to set the guns, fighters, and perhaps searchlights in action to deal with them. Signallers must always be at their posts, and they must always be wide awake and thoroughly up to their jobs. Over-tired men might well cause a tactical breakdown which could have serious results. It is also possible that regular R.A.F. signallers might have to leave their ground posts to take their places in bomber aircraft, and they would have to be replaced by men who were fully competent on the ground, but not necessarily trained in working from the air. Radio reservists may also be sent into the air.

What is Wanted?

THAT the wireless amateurs of the country are keen to give their services to the nation was proved by the prompt response made to the first announcement about the formation of the radio reserve. Next morning there were about a hundred enquiries and applications made at the Air Ministry before the post came in, and within 48 hours a thousand applications came in from all over the country. Yet, at that time no one knew exactly what the Air Ministry wanted and what the duties of the reserve men would be.

Light was thrown on this by the Air Ministry Director of Signals, Air Commodore C. W. Nutting, in an address to the Radio Convention last Saturday. He said that the communication system of the R.A.F. was among the biggest and most complex systems in existence to-day. If we were involved in war the regular signals personnel of the R.A.F. would have to be supplemented very considerably, and it took a considerable time to train a person in signals matters. The Air Ministry first wanted men who already possessed transmitters because they would need less training. They would all have to become proficient in morse, and then they would have to become familiar with R.A.F. procedure and language. That, said the Air Commodore, should not be hard. All the same, it is very necessary. Men who are used to the official language of the Service might be entirely misled if they received signals from operators who were unfamiliar with Service matters and Service equipment. Even radio telephonic conversations between ground stations and fighter patrols in the air sound almost unintelligible jargon to the civilian the first time he hears them, yet they have been proved the best way of making the fighters understand what they have to do.

The organisation of the radio reserve will start in a flexible way, with the country divided into areas, groups and sections, but it will be elaborated as the scheme takes shape. The men to whom the appeal is made are all enthusiasts, and success for the scheme is not in doubt.

Food for Thought

THE first time Dr. Claude Dornier startled the flying-boat world was with the twelve-engined Do. X boat. That was many years ago, and the machine was something of a white elephant. But Dr. Dornier had shown the world that the large flying boat was possible. He was severely handicapped at the time by the lack of suitable engines, and to get the aggregate power necessary he had perforce to resort to a multiplicity of power plants which rather spoiled the aerodynamic efficiency of his machine.

Although far less spectacular in size, the latest Dornier flying boat, the Do. 26 described this week, is as remarkable in many ways as was the Do. X, and in some respects more. The Dornier engineers were faced with the problem of carrying 80,000 air-mail letters from Lisbon to New York non-stop, a distance of about 3,500 miles. Their solution is extremely interesting. They did not design a huge flying boat with six engines. But they did take advantage of every known modern aid to efficiency and long range.

They designed for catapult launch from a mother ship; they abandoned the sponsons and introduced retractable wing-tip floats; they placed their four engines in tandem pairs and arranged for the pusher engines to be tilted at the take-off so as to get the airscrews clear of water spray; and they took advantage of a development in which Germany has, *zielbewust* one may be sure, established a long lead over the rest of the world; they used diesel engines.

The result is the Do. 26, which weighs 44,000 lb. gross when launched by catapult; which has a maximum speed of 208 m.p.h. and a cruising speed of 192 m.p.h.; and which has a maximum range of 5,600 miles. The interesting fact is that the machine is comparable in weight and performance with the Short long-range Empire boats used in the British experiments, but the range is very much greater. That is partly due to the greater wing loading (34 pounds per square foot), but mainly to the use of diesel engines. The moral is obvious.

Imperials Lend a Hand

EVERY day the Royal Air Force—and for that matter Air Forces the world over—learns more and more from commercial operators. The latest story is that the Service has sought the aid of Imperial Airways pilots in evolving a routine for flying their new Short Sunderland flying boats, which are, of course, essentially similar to the Empire boats. Apparently Service pilots found the new boats rather a handful in the first instance, because the first pilot did practically all the work, operating not only the flying controls and throttles but taking out the over-ride boost after take-off, changing airscrew pitch and working the flaps. Now that they have adopted the Imperial Airways routine, whereby the majority of such tasks are delegated to the second pilot acting on verbal orders from his chief, they are perfectly happy.

Maybe the Ensign pilots will be able to offer a few pointers to prospective pilots of the four-engined bombers, which should soon be out.

Custom Customs

THE Civil Service is a law unto itself, and nowhere more remarkably so than in the world of Customs and Excise. Quite a long time ago a certain foreign operating company proposed to demonstrate an aeroplane which they were using for training, and were told that if they wished to let people fly, or fly in, the machine over here it would be necessary for them to pay the full Customs duty on it—though the machine was only to be in this country for a couple of days at the most.

Apparently during the last year or two the Customs authorities have discovered that sales demonstrations of a temporarily visiting foreign product can make the "importer" liable to duty. So far as aeroplanes are concerned this simply means that, though a machine can be exhibited and demonstrated and all the people in the world may march through the cabin and take a very thorough look at all the equipment, these people may on no account be taken up in the air with it.

Rules are made to be broken and it is very difficult indeed to see the difference between inspection on the ground and inspection in the air. Evidently the Customs authorities have had to decide where the line shall be drawn, and, to give them credit, appear to be perfectly frank about the absurdity of the situation. Nevertheless, this arrangement can make it very difficult indeed for the various operating companies who wish to show people in this country something of the qualities of a new machine which they propose to put on their airlines. The only way out of the difficulty, apparently, is to take a party at considerable expense over to the foreign country and to fly them back on service in the new machine.

The Edmonton Tragedy

MOST profound horror has been caused by the crash of an Audax machine on to houses in Edmonton, in North London, which not only killed the pilot, a sergeant of the R.A.F. Volunteer Reserve, but also caused the deaths of a number of people in the street and in the two houses which were struck.

One has no desire to add to the distress of the relatives of the pilot (who was a practical pilot, and, incidentally, an official of the Civil Aviation Bureau, Air Ministry) by laying the blame on a man who has lost his life. At the same time, everything possible must be done to prevent similar tragedies in the future. Various theories have been put forward as to the reason why the machine had to come down; it may have been that the Audax had taken off on the gravity tank, which is normally used only for starting purposes. Whatever the cause, the fact remains that the failure of an engine ought never to culminate in a forced landing in a populated area, with consequent loss of life and damage to property.

The Air Ministry has laid down a salutory rule for preventing such disasters. No minimum height is specified for an aeroplane when flying over a town or populated area; the rule is that the pilot must fly at such a height that in the event of engine failure he is able to glide clear of the area and land outside it. It is the duty of every commanding officer and flying instructor to impress that rule upon all pilots so thoroughly that there is no likelihood of anyone forgetting and violating it. Slackness in that respect may easily lead to other deplorable accidents.

DIARY OF FORTHCOMING EVENTS—PAGE 204

EMPIRE

Being an Informal Record of a Voyage Down the Australian Route in R.M.A. "Camilla"

PART I

By H. F. KING

THIS is the first instalment of a series of articles by H. F. King, written after a flight to Australia and back by Imperial Airways Short Empire boats. "Flight" sent the writer—a member of its staff—to obtain first-hand impressions of the long Empire route and of commercial and military aviation in the Commonwealth.

I WAS uneasy; apprehensive lest my compulsory vaccination should have started some arterial insurrection and oblige Imperial Airways to alter the dates on the ticket. The doctor had looked pleased and signed a certificate now reposing with the ticket and passport, the latter sporting Siamese and Iraqi visas.

And so past the Waterloo barrier with those "did I switch off the radio?" qualms.

* * *

A board marked "R.M.A. *Camilla*" denotes the reserved coach. I am "Ex Waterloo, 1930, 20/7/38."

Dinner, and another supreme effort to set the mind in order on this whole business. To-morrow I board an Empire flying boat to fly to Australia. Reasonable enough. Or is it? No, not Australia. France, perhaps. Or Italy. But not Australia. Of course, there's no reason why one shouldn't fly to Australia. I've read of people doing it. What's more, I've spoken to at least half a dozen who've made the trip. But the suggestion that in nine and a half days one will be under the world in that big, detached-looking country which was rather a nuisance to draw at school doesn't go down easily like the chicken. It sticks in the mental œsophagus.

In the South Western Hotel, Southampton, an Imperial official hands out cards with directions for to-morrow. These people obviously intend that I *shall* fly to Australia. A call at 4 o'clock, insists the card. . . .

Friday, July 22.—Southampton Docks at five in the morning looks like a damp, drab, hurried water-colour, and the lighted cabins of *Camilla* are so cosy and homely. More like an optimistic mock-up than a two-year-old reality. The substantiality of these boats, we decide, is accentuated by their fine proportions. But it's much too early and chilly to get technical. Feeling like modern Jonahs entering a very refined and accommodating whale we step inside from the pontoon.

As one or other of these craft will virtually be our home for nine and a half days at a stretch (though we shall sleep ashore) we had better get acquainted with their layout. This front compartment was originally a smoker with settees for seven, but has been converted into a hold for freight and mail. However, there are three more cabins farther aft, the floors of which are on progressively higher levels as the hull sweeps up. The midship, or spar, compartment is separated from the forward hold by the kitchen and lavatories; next door is the promenade cabin with promenading space half as wide as the compartment itself. Another step takes us up to the smoker, aft of which is an additional hold for baggage and freight. Here one may study the hull construction, for Mr. Rumbold was turned loose only in the passenger cabins.

There is no soundproofing anywhere in the boat. It was discarded as unnecessary in the prototype.

The famous chairs really are delightful. Simultaneous operation of a lever on each side of the seat gives one fine adjustment of angle between the bolt-upright and fully reclining postures.

Our crew are five: Capt. Woods, First Officer Murray, a radio operator, flight clerk and steward. All except the clerk and steward are normally accommodated on the top deck, the mystic heights of which may be attained (though not by passengers) with a vertical ladder opposite the forward entrance (front door to us).

There has been a notable gravitation of our fellow passengers to the smoker, but the flight clerk, who knows all about weight distribution in relation to the c.g. (just by the doorstep of the spar cabin where we are seated), brings two of them forward Not that these Shorts are sensitive about that sort of thing, for half a dozen passengers can migrate *en bloc* from one cabin to another, their entire movement being countered by a modest turn on the tail trim wheel.

Those whistlings outside mean we are casting off; there is a simple code of signals with the whistle for handling on the water: "L" (in Morse) is "let go," "P" is for "port drogue," and "S" "starboard drogue." We slip away from the pontoons.

These boats must necessarily taxi to warm their engines, so we motor down Southampton Water. Liners, cranes, launches, and yachts are framed in the windows. A buoy winks red. We rock gently in the swell as we turn for the take-off. The hard-working little electric flap motor churns noisily away and the big Gouge flaps come sliding out of the trailing edge to take-off setting. The four Pegasus are given full rein. A bow wave forms and grows, creeping back, back. . . On the step; the docks race past and we unstick almost without knowing it. The engine note drops as Capt. Woods relieves the engines of their over-ride boost and changes pitch. The little motor draws the flaps snug into the wing. We rise with the sun. That man opposite has not even looked up from his paper.

The last lights of Southampton are going out as we climb up among the grey clouds. Two Stranraers are at anchor off Calshot. Now the Solent is shut from view by an un-

broken cloud. The steward tucks us up in rugs. The ragged weave of the cloud carpet does not thin until we see the poplars of France casting their long shadows in the early sun, and the sandy-bedded Loire with its countless islands winding its way westward to the sea. Orleans is lost in the mist. On across the Rhône with the ruined *Pont d'Avignon*, famed in the song of our schooldays, a monument to the sturdy masons who challenged the swiftly flowing river.

Yes, steward, we shall be delighted to take breakfast with the Captain.

This is Capt. Woods' sixth trip in command of an Imperial flying boat on the Southampton-Singapore section of the Australia route. Previously, he was on Atalantas, then took the A.S.T. flying boat course. In accordance with Imperial Airways' policy of changing pilots every two or three days on the Empire routes he is flying us as far as Alexandria before taking another boat on to Karachi, and a third to Singapore.

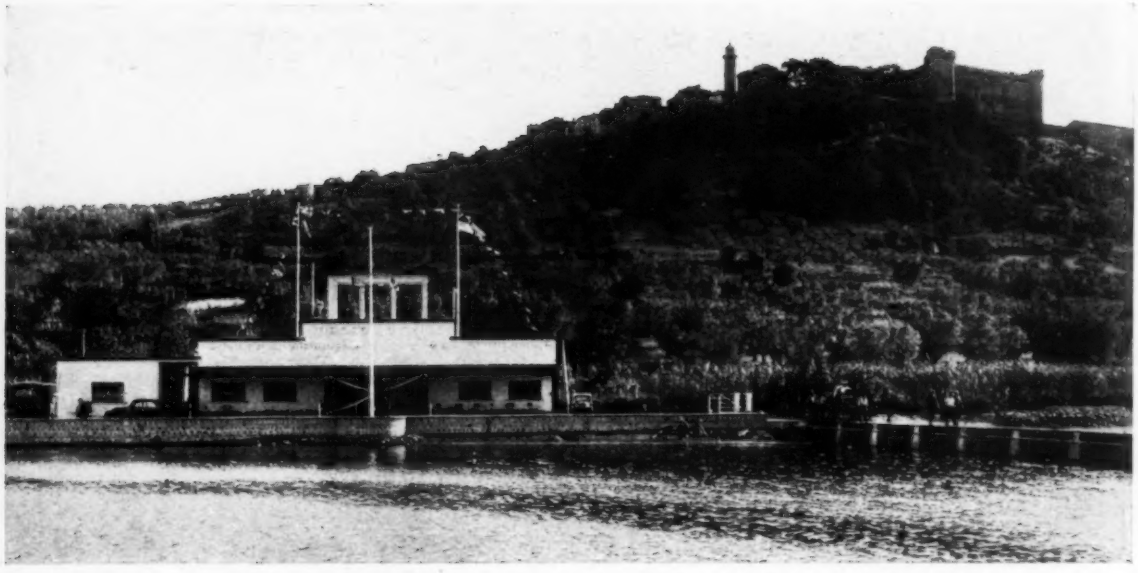
We talk of many things. Those spinners fitted experimentally over the hubs of the outboard airscrews; they will probably help in the fight against ice, though they have no slinger rings like the American ones. . . *Camilla*, says the Captain, is a good boat and has a very well-behaved "George," or automatic pilot (Imperials use Sperrys, but the Farnborough nickname now seems to be universally employed). Not that there are any bad boats, but some do exhibit various little traits which give them individuality. . . . Our total payload is 3,200 kilos. . . . We are cruising at 160 with a slight tail wind. . . . The French wireless stations are very good. No, the status of an Imperial flying boat captain does not yet correspond with that of a steamship captain; he has no authority, for example, to officiate at weddings. Sometimes the boats land at Macon or St. Nazaire on their way to Marseilles, for it is nearly 600 miles from Southampton. . . . We despatch the eggs and bacon, discussing take-off technique, and the coffee disappears with an exchange of views on ultimate landing speeds.

This sign at Waterloo station is the passenger's first intimation of the name of the machine he will catch on the morrow.

We approach the inland lake of Marignane, or the Etang de Berre, as it is often called. It is three or four miles north of Marseilles, and it is used very extensively by civil and military marine aircraft. There is one small outlet to the sea.

Two Breguet Bizerte flying boats pass half a mile to port; well-worn Potez biplanes and more modern Mureaux parasols circle the land aerodrome; and one of the old Breguet-built Calcuttas skims over the lake as our flaps start grinding out. Our reflection gets larger and larger in the glassy water; the impact itself is scarcely noticed. *Camilla* taxies towards the landing stage through her own wake. There are sunburned men in berets, a Shell lorry unshipping its hose, the old transatlantic Bleriot *Santos Dumont* is on the tarmac and behind the breakwater is one of the new Liorés with tandem Hispanos. Imperial Airways share a waiting room with Ala Littoria, but it is more pleasant out in the sun. There are no clouds now, except over the Alps.

Henceforth the cooling gills round the skirts of *Camilla's* cowling are continuously open. Back in the air I take off



The new marine airport building at Lake Bracciano, about thirty miles from Rome.

my jacket and direct the cooling stream from the little spherical ventilator directly on to my face.

After about twenty minutes, we are nosing through a white-flecked sky over the Gulf of Saint Tropez, into a Mediterranean almost powder-blue in the haze, with the Riviera on our left. A hundred miles or so and out of the blue comes Corsica, its northern neck lying right on our course—set, by the way, for Lake Bracciano, near Rome. But not a brigand in sight. Sheer granite rocks, grey, green and brown, with narrow roads snaking among the hills, between St. Florent on the west coast and Bastia on the east. Our ground speed is 155 m.p.h.

Between Corsica and the Italian mainland are the islands of Pianosa, Elba and Monte Cristo.

And so across the Tyrrhenian sea to Lake Bracciano, where the blue of our bow wave is the blue of a tiled swimming bath. The wave curves up, solid-looking, and hits the flaps. The Italian flag is hoisted on our mast in addition to the Air Mail pennant and the Civil Air Ensign. Ashore is a new little administrative building marked *Idroscalo Civile;* like that at Marseilles, it is shared by Imperial Airways and Ala Littoria. There is a pleasant babble of Italian. *Camilla* twists and turns at her moorings.

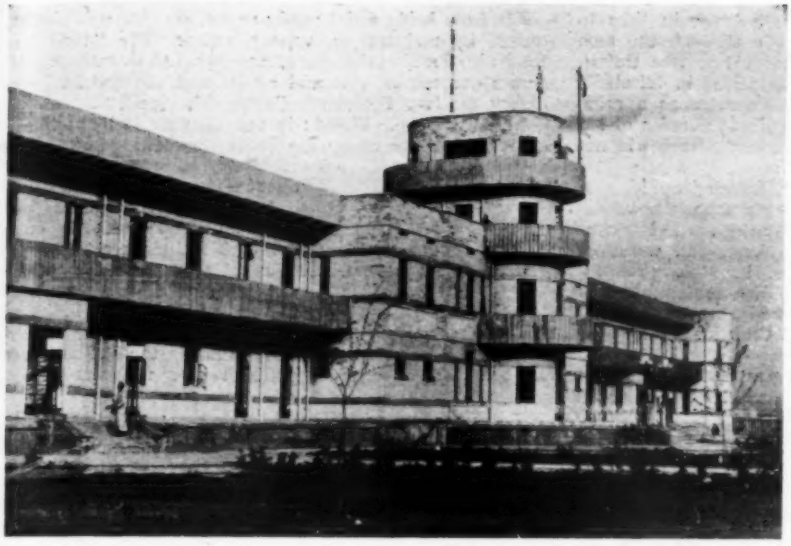
Back in the air, picking up a course for Brindisi, we can see our wake distorted by wind or current. The steward adjusts our baize-covered table and lays for lunch. Big cumulus clouds obscure the hills below and there is nothing to distract us from the grape-fruit, asparagus, chicken and salad.

The captain, passing through for a chat and a smoke, explains that sometimes, instead of laying a direct course for Brindisi, which demands flying at about 10,000ft., the boats make a detour of a few miles by way of Benevento in a big transverse valley. Then there is no need to go higher than about 4,000ft. Any such deviations, by the way, are entirely at the discretion of the captain.

The clouds clear as we come down into the coastal plain with its citrus, olive and pomegranate trees and sweep into Brindisi, the termination of the Appian Way, which connects it with Rome. Of more topical interest, it is a strongly fortified naval and seaplane base. One finds it difficult not to notice the big coast-defence guns (or rifles, as the Americans call them) and the anti-aircraft batteries. An Ala Littoria launch lands us close by a hangar housing at least half a dozen three-engined twin-float coast-defence Cant bombers. We cast an eye over a Macchi of Ala Littoria (it has two Pegasus) and an elderly twin-hulled Savoia with a pair of water-cooled Isottas which taxies out and roars over the water for an unconscionably long time before unsticking. We are asked to return to the waiting room.

The return has its compensations, for we discover an excellent strip map of the Brindisi-Athens section issued

Tiberias, on the Sea of Galilee, seemingly quiet, but a centre of the present troubles.



The fine marine airport hotel at Basrah. Behind is the land aerodrome.

by Ala Littoria. It shows Greece's profusion of islands, inlets and mountains in great detail.

So out over the Brindisi breakwater across the Straits of Otranto and down over the Othonian Isles (one of which is said to have been the Isle of Calypso) to Corfu, with the Griva mountains of Albania to the north-east. The island of Corfu shows up light brown in the afternoon sun. There are shapely schooners in the harbour. Tales of antiquity flow fast through the mind as *Camilla* sweeps across the Gulf of Arta. On its south side is Actium, where the light craft of Octavian wrought havoc among the unwieldy vessels of Mark Antony in 31 B.C.

Now down over the mountains to the Gulf of Corinth, or Lepanto where Don John of Austria, leading Spanish and Venetian ships, defeated the naval might of Turkey. Farther east is Missolonghi, where our own Byron fell for Greece.

Captain Ian Ross, who took over at Karachi, studies a weather report.

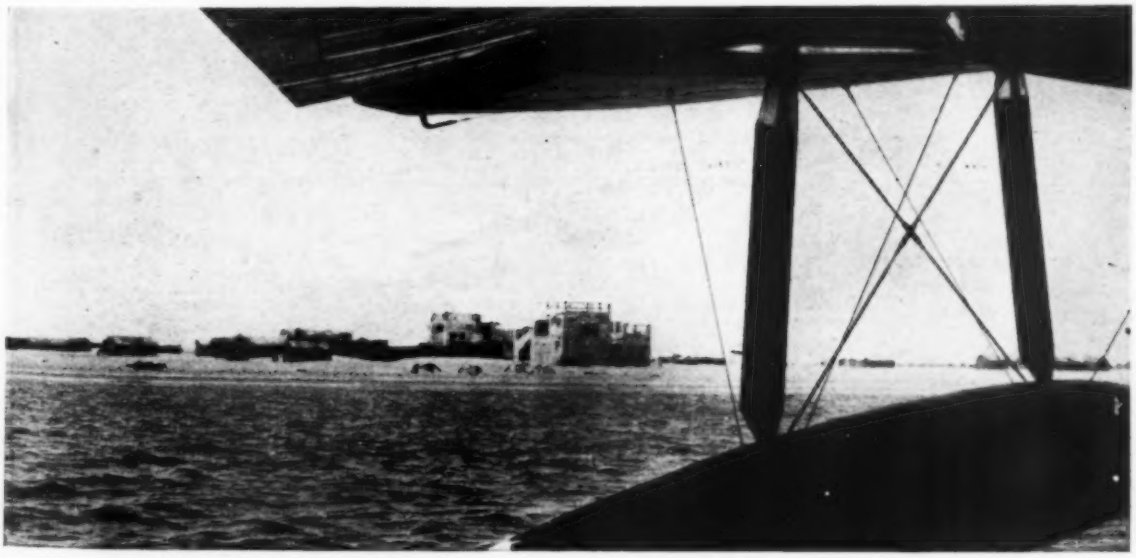
The sun is very low now, behind a peak, outlining it as with a pen dipped in red ink. A ship noses into the Corinth Canal, dream of Nero, Cæsar and Hadrian. And so in the dusk, past Salamis, mentioned by Homer as the home of the Elder Ajax, and down to a perfect alighting in Phaleron Bay at Athens.

The flight clerk decides to run up the flag, though it is almost sundown. An Air France Lioré, riding lights glimmering, is anchored nearby. Athens is waking up for the evening.

Going ashore, we get our first chance for conversation with the Man who Read the Paper during the First Take-off. He is Mr. M. H. C. Gordon, outside representative for Shorts, and is taking a party of men down to Dabai to repair two Qantas boats which had a mild collision on the water.

Cars take us to the Hotel Grande Bretagne. Here we are handed another of those helpful little cards telling us that we shall be called at 4.15 a.m.; that baggage should be outside our rooms at 4.45; that currency coupons (issued by Imperial Airways, value 5s.) will be changed at drs. 134.50; that the car will leave the hotel at 5.15 for take-off at 6; that stops will be made at Alexandria, Tiberias, Habbaniyeh and Basrah; that breakfast and lunch will be served in the air; and that Mr. Lagopoulo, the Company's representative, will give us any further information or assistance we may need during our stay in Athens.

Saturday, July 23.—Down to glinting Phaleron. *Camilla* is ready and waiting and the four Pegasus start at a touch. The countless islands of the Cyclades trail



Dabai, a refuelling halt on the Persian Gulf. The rest-house is in the form of a fort ten miles away, at Sharjah.

past soon after take-off. We doze, but stir in time to see mountainous Crete in the distance through the rash of little white clouds. The sea looks rather like tinfoil. Sometimes the Imperial flying boats alight in Mirabella Bay, where the yacht *Imperia* gives service as a radio station. The map shows something like 370 miles of sea between here and Alexandria, so another snooze will not be out of place.

Alexandria—Egypt's chief seaport, founded by Alexander the Great—looks tremendously busy and has a bewildering variety of shipping. Capt. Woods brings us in low over a steamer which has air-minded stokers, and we moor close by *Cambria* (now stripped of her "long-range" accoutrements and serving the Empire routes like her sisters), disembarking into a handsome Power Boat. Past the police and into the British Boat Club for a lounge on the balcony.

Often—in fact, normally—passengers change boats at "Alex," but we gather that *Camilla* will be taking us all the way through; at least as far as Singapore. But we do get a new crew; our skipper is Capt. Mollard, assisted by First Officer Davys. Now for the Holy Land.

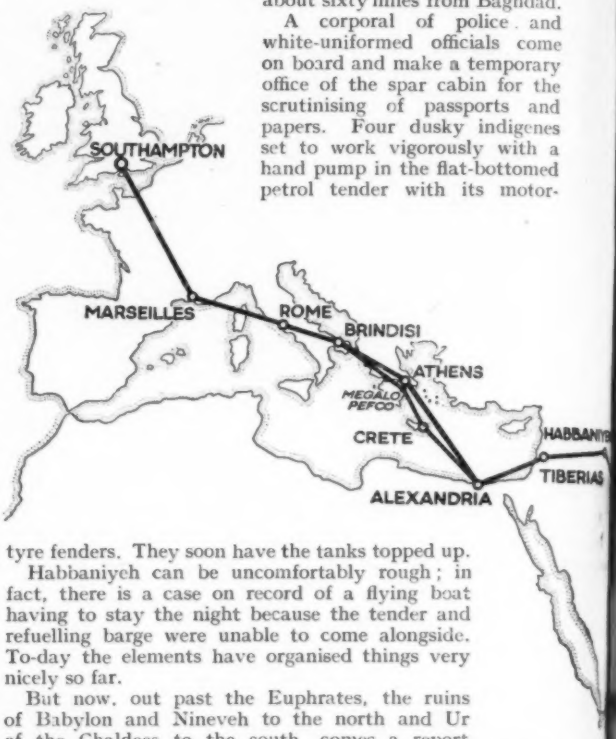
Galilee

Once clear of Alexandria we pass Aboukir Bay, polish off the last stretch of the Mediterranean and cross the coast just south of Haifa, at the foot of Mount Carmel. A section of the Iraq Petroleum Company's pipe-line discharges here. The bumps are becoming noticeable, particularly round Nazareth. The Sea of Galilee looks something like a harp. On its eastern shore is the little town of Tiberias, where we taxi up to moorings under the watchful eye of the coxswain in the control launch. When the flight clerk opens the door the heat floods in, but the launch makes a cooling draught and the trees ashore, beneath which we take a lemon-squash with Imperial Airways, give delightful shade. Sunburned troops, drafted here for the Trouble, splash noisily in the water. The Essex Regiment, I believe.

Capt. Mollard takes off without feeding the engines their usual over-ride boost, for we are 800ft. below sea-level. But the run is short enough and we clear the hills easily, heading more south toward Lake Habbaniyeh. Now we have desert, desert, desert—Syrian, Transjordan and Iraqi. Capt. Mollard climbs high—an advisable measure over deserts, in the interests of comfort. A little guide issued by Imperial Airways informs us that after Syria we skirt the Hauran, formerly the land of Bashan, peopled by a race of giant men, and now the mountain stronghold of the Jebel Druses.

Far from being a flat sandy waste, the desert is characterised by undulations, valleys, rocks. The "road" of the Nairn Trading Company, leading up to Damascus, cuts across our course now and again, and the watchful can descry the Iraq Petroleum Company's pipe-line.

There is a lake ahead; in the distance it looks like a great pool of ink which has flooded into the desert. It is Habbaniyeh, a refuelling stop about sixty miles from Baghdad.



A corporal of police and white-uniformed officials come on board and make a temporary office of the spar cabin for the scrutinising of passports and papers. Four dusky indigenes set to work vigorously with a hand pump in the flat-bottomed petrol tender with its motor-tyre fenders. They soon have the tanks topped up.

Habbaniyeh can be uncomfortably rough; in fact, there is a case on record of a flying boat having to stay the night because the tender and refuelling barge were unable to come alongside. To-day the elements have organised things very nicely so far.

But now, out past the Euphrates, the ruins of Babylon and Nineveh to the north and Ur of the Chaldees to the south, comes a report (via the kitchen) of a sandstorm ahead. The wireless operator can contact neither Basrah nor Baghdad. We are turning back to Habbaniyeh. Capt. Mollard puts us down gently, moors up and trims the airscrews to positions allowing easy passage for boats underneath.

Off into the sunrise: The early rising day after day is not really so bad. After take-off, passengers usually have a sleep before breakfast.

Who, he asks, is for taking a car to Baghdad, and who is staying on board for the night? Everyone, in excellent spirits, sticks to the ship. There is Mrs. Lee Warren, wife of an Imperial Airways official who joined us at Tiberias on her way East to meet her husband; two Army officers for India; Mr. Luck, a ground engineer Singapore-bound; Mr. Gordon and his "lads" and our congenial and ever-obliging crew. We may as well go ashore, where there is a little quay for the marine craft, a tent and a hut used by the R.A.F. as a sailing club. The Service undoubtedly has a civilising influence.

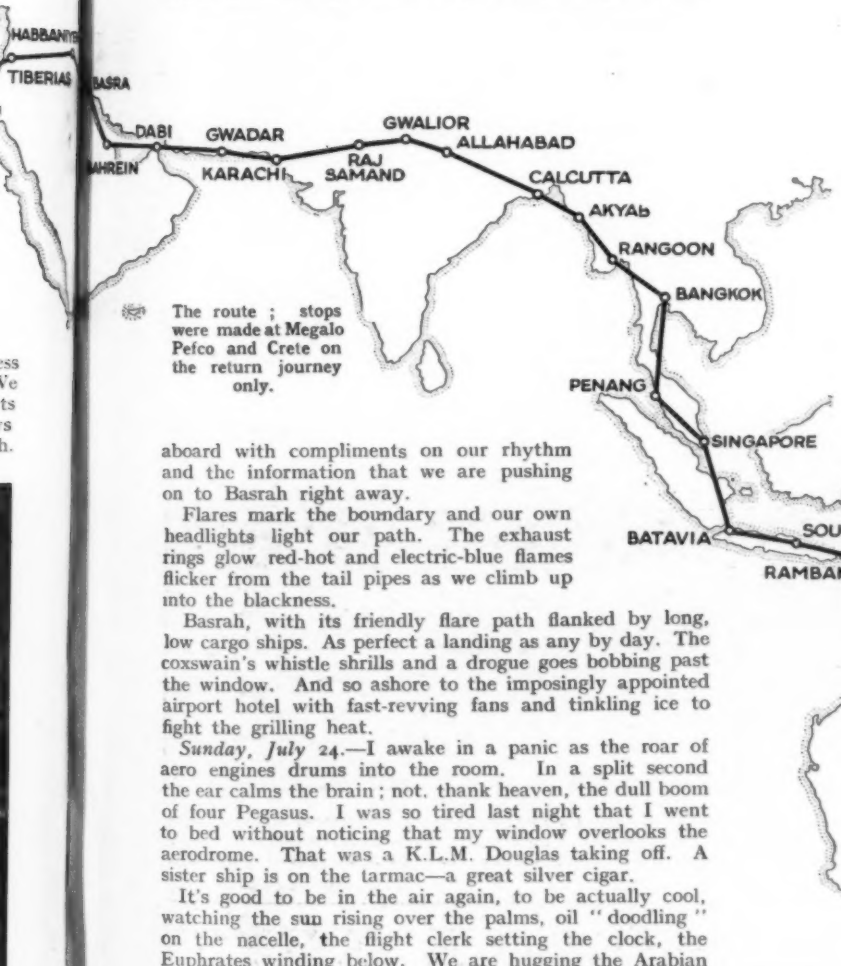
But the heat. . . . We resolve to swim with Mr. Gordon, take a small launch back to *Camilla* (how grand she looks, and how attached to her we have become!) and grope in our cases for swim suits. It is quite dark now and we start changing in the launch.

I float on my back. Life seems very new, the strangely warm water, the almost sacred silence of the desert night, occasional laughter from the others ashore, the distant splashings of Gordon.

Back on board someone ferrets out a tortoise from a suitcase. What a priceless scene: an assortment of perspiring grown-ups competing for the favours of a six-inch tortoise on the carpeted floor of a brightly lit flying boat late at night on a lake in the middle of the desert.

Then one of Mr. Gordon's merry men produces a mouth organ and "swing" holds sway until the Captain steals aboard with compliments on our rhythm and the information that we are pushing on to Basrah right away.

Imperial Airways are certainly not lacking in enterprise: the signpost at Karachi.



The route; stops were made at Megalo Pefco and Crete on the return journey only.

Flares mark the boundary and our own headlights light our path. The exhaust rings glow red-hot and electric-blue flames flicker from the tail pipes as we climb up into the blackness.

Basrah, with its friendly flare path flanked by long, low cargo ships. As perfect a landing as any by day. The coxswain's whistle shrills and a drogue goes bobbing past the window. And so ashore to the imposingly appointed airport hotel with fast-revving fans and tinkling ice to fight the grilling heat.

Sunday, July 24.—I awake in a panic as the roar of aero engines drums into the room. In a split second the ear calms the brain; not, thank heaven, the dull boom of four Pegasus. I was so tired last night that I went to bed without noticing that my window overlooks the aerodrome. That was a K.L.M. Douglas taking off. A sister ship is on the tarmac—a great silver cigar.

It's good to be in the air again, to be actually cool, watching the sun rising over the palms, oil "doodling" on the nacelle, the flight clerk setting the clock, the Euphrates winding below. We are hugging the Arabian coast down the Persian Gulf, making for Bahrein, a pearling centre.

From the jetty at Bahrein we watch shoals of little fish weaving through the clear water. A breeze which sends the dhows scudding along makes the heat bearable.

Off again, we strike east for Dabai. The desolation of this little refuelling station is mitigated by the presence of two Ford Utilities used to take passengers who are stopping the night to the rest house—actually a fort at Sharjah, ten miles away. A formidable, but undemonstrative, gentleman, one hand on the hilt of his dagger, eyes us appraisingly.

At Gwadar, across the Gulf of Oman, there is a camel. Though lacking in bodily distinction he seems a wise old beast, and obviously views Imperial flying in its true perspective. We rumble in close enough to see the expression on his face. He ruminates without exhibiting the slightest concern at our proximity and follows our passage with his head, musing, I am sure, "Just another of those . . . flying boats."

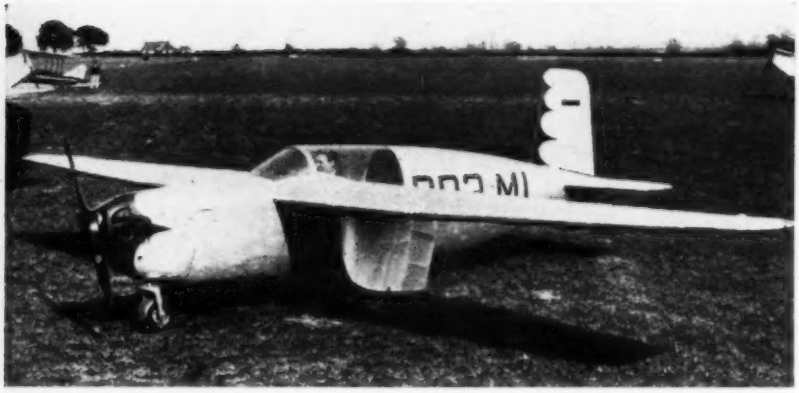
Now, between Gwadar and Karachi we are passing one of the most fantastic sections of coast imaginable, with rocks suggesting all manner of buildings and devices.

Karachi . . . India. . . . We touch down alongside big cargo steamers. The doctor approves our pulse and we are off to the hotel, where we meet Capt. Ian Ross, who will be taking us across India and down to Singapore.

(To be continued.)

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS



LOGICAL UNCONVENTIONALITY? The De Bruyne-Maas Ladybird, which has been used at Cambridge for the purpose of trying out a number of ingenious ideas. It will be seen that the machine is a shoulder-wing monoplane with a tricycle undercarriage, and the design incorporates various interesting items of what may be termed near-bakelite construction. The trailing edge of each of the main undercarriage trousers can be turned to provide air-braking surface. Mr. R. G. Doig carried out the initial test-flying both with the original Scott engine and with the Bristol Cherub with which the machine is now fitted.

SLOUGH URBAN DISTRICT COUNCIL have approved the plans for a factory and aerodrome to be built by Hawker Aircraft at Langley, Bucks.

Another important site recently approved is that for the new A. V. Roe works at Greengate, Chadderton, near Oldham, Lancs. Preparation of the site by the En-Tout-Cas Co. begins this week. Avro also intend to install plant at the former Whitelands Spinning Mill, Stalybridge.

Early last week, Gen. Milch, German Secretary of State for Air, and Lt.-Gen. Stumpff, Chief of the German Air Staff, left Tempelhof, Berlin, for Stockholm, to repay a visit paid last year by Lt.-Gen. Friis, of the Swedish Air Force.

The fund raised in South Africa on behalf of the dependents of the R.A.F. and South African Air Force men killed in the Limpopo air crash on June 6 has realised over £18,000.

On board *s.s. Empress of Australia*, which is due in at Southampton tomorrow, September 9, is Mr. Edwin Link, accompanied by his wife. Mr. Link, who is an expert flying instructor and blind-flying pilot, is the inventor of the Link Trainer.

Inaugurating Sweden's Civil Aviation Week, Scandinavia's largest air display will be staged next Sunday, September 11, at Bromma Airport, Stockholm. Over 110 service aircraft will take part in the programme, in addition to 20 private-owner entries drawn from Sweden, Norway, Finland and Denmark.

When a R.A.F.V.R. machine struck an overhead power cable in making a forced landing near Cadmore End, High Wycombe, Bucks, last week, the electricity supply over a large area was cut off. Fortunately the machine did not catch fire and the pilot was unhurt.

Early last week Major Alexander de Seversky flew from Floyd Bennet airfield, Long Island, to Glendale, California, in 10 hr. 3 min., breaking the record for 2,500-mile East-West crossing, previously held by Roscoe Turner, by 1 hr. 27 min.

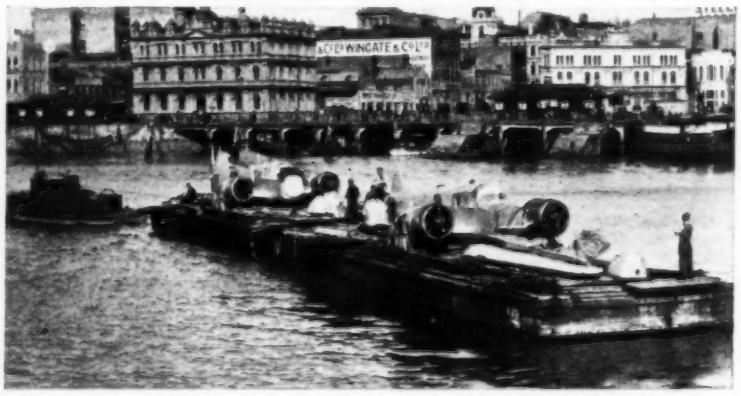
Twenty-five Years Ago

(From "Flight" of September 6, 1913.)

"At Aldershot on Thursday of last week Lieut. Lawrence made a splendid attempt to beat the Army altitude record of 13,500ft. put up by Lieut. de Havilland last August. During a flight which lasted 1 hr. 40 min., Lieut. Lawrence, who had Capt. Cordnor as passenger, reached 10,500ft."

The annual Bendix Trophy race from Los Angeles to Cleveland, Ohio, was won last Saturday by Miss Jacqueline Cochran, who covered the 2,042 miles in a modified Seversky pursuit machine in 8hr. 10min 31sec. Miss Cochran went on to Floyd Bennett airfield, New York, to put up a transcontinental record for women by covering the distance in 10hr. 12min. 55sec.

The new German airship LZ130, which is being built at Friederichshaven, to replace the ill-fated *Hindenburg*, should be ready for her first trial flight towards the end of this month. Owing to the difficulty of obtaining supplies of helium, the LZ130 is to be filled with hydrogen and will be used for carrying freight until such time as helium becomes available. There have been rumours of experiments with "synthetic helium."



THE OXFORD BOAT: Airspeed Oxford twin-engined advanced trainers being shipped to the Royal New Zealand Air Force base at Hobsonville for assembly. They are the first of five ordered. Thirty Vickers Wellingtons are scheduled for later delivery.

Forthcoming Events

September 10. Cardiff Aeroplane Club: London-Cardiff Race.
September 11. Gordon Bennett Balloon Race, Belgium.
September 11-18. Swedish Civil Aviation Week.
September 21. Aero Golfing Society: Cellon Trophy, Richmond Golf Club.
October 15. South Coast Flying Club: Annual Dinner and Dance, Grand Hotel, Brighton.
October 20. R.Ae.S. Lecture*: "Light Alloys in Aircraft Construction," by M. le Coeuvre.
November 3. R.Ae.S. Lecture*: "The Meteorological Problem of the North Atlantic," by Capt. F. Entwistle, B.Sc.
November 9 (Wednesday). R.Ae.S. Lecture*: "American Aircraft," by T. P. Wright, F.I.Ae. S., F.R.Ae.S.
November 18 - December 4. Paris Aero Show, with Air Transport Congress.

* All these Lectures take place at 6.30 p.m., at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

C.A.G. AND THE PRIVATE PILOT

Priority for the Air Guard?

IN a letter in your issue of August 25, "'A' Pilot" says: "In this mad rush of flying training is the sporting side of the game to be strangled, and the pre-C.A.G. caged? In other words, is it going to be worth it?"

If the sporting side of flying is going to be strangled by the multitude, most of whom will be joining the C.A.G. with a view of contributing to the strength of air defences, most certainly it is going to be worth while! Because of the obligations of a member of the C.A.G., priority over non-C.A.G. pilots should be given in the use of all available aircraft for training, regardless of the price "A" pilot is prepared to pay for his fun.

C.A.G. CANDIDATE.

London, N.10.

"Something for Nothing"?

IT appears that friend "Indicator" still misses one point in connection with the C.A.G. scheme and its effect upon those enthusiasts who, having obtained their "A," now wish, not necessarily to hire machines for long-period travel, but to proceed with more advanced training.

It is not a question of being a "snob club," or of consideration of those very select few who, spending £500 yearly, could afford to buy their own club machine, but a question of whether those numerous *real* enthusiasts (*i.e.*, those who have taken flying seriously and paid for their training out of their very limited means) are to be given any encouragement or whether they are to be penalised by a virtual cessation of their training in favour of the "something-for-nothing" C.A.G. member.

The school or aerodrome owner will be more concerned with turning out C.A.G. "A.s," which (remembering the number of applicants under this scheme and assuming that 20 hours' average is required to make an "A" pilot) will mean no planes, instructors or time for the pre-C.A.G. pilot.

To the enthusiastic man with very meagre means flying has previously been available through the organisation to which I am proud to belong—the Civil Aviation Service Corps—and which has had squadrons operating in various areas, such as Kent, London, Hemel Hempstead, Cambridge, and Romford.

In view of this and the last paragraph of your article, "C.A.G. Points" (September 1), it is obvious that the larger percentage of C.A.G. applicants are merely out for "something for nothing," and, if the applicants mentioned are representative, show that 40 per cent. could have flown previously if they had the necessary interest; if not, why do they wish to fly now?

The C.A.G. scheme is with us, and in view of its manifest advantages has, we hope, come to stay. But is it too much to ask that some practical consideration be given to the pre-C.A.G. pilots to assist them in the more advanced training, or is the C.A.G. member considered of more value in his potterings around the home aerodrome?

London, S.E.2. MEMBER NO. 50,
Civil Aviation Service Corps.

Enthusiastic, but "Too Old" for the Service

A REGULAR reader for the last ten years, receiving a vast amount of education and untold consolation from your excellent paper, may I state my views on this C.A.G. business? An "A" licence pilot from 1932-33, entirely at my own expense, without warning I found myself three weeks too old for a R.A.F. short-service commission when the age limit was changed from 22 to 21. I then asked how long it would take to become a sergeant in the R.A.F., and was told five years at the least. As 25 was the age limit for a flying course, I should have been at least a year too old.

As I had to earn my own living I had to leave flying and console myself with *Flight*. When the R.A.F.V.R. came into being I jumped for joy, and as soon as I was free to do so away I went to join, only to be informed that, at 28, an ex-"A" licence pilot, I was too old to do so, the age limit being 25, as in the R.A.F. If I cared to do up to 100 hours' flying at my own expense I could be considered. What irony! Then into being comes the C.A.G.; well, I am in that, but why, in the name of all that is sane, is the Government killing the scheme before it has started? Instead of merely whetting people's appetites with 10 hours per annum, why do not they let those who show ability and keenness be drafted into the R.A.F.V.R.—within reasonable age limits, of course? If that would not suit the powers that be, then form another reserve movement and let us graduate into it. Let it give us a really good all-round training, so that should we ever be needed we shall not have to stand there kicking our heels, too old to serve in the way we could give our best. It takes time to train pilots. Why not do it whilst we have time, then all could help?

R. A. BAILEY.

Brighton.

"Justifiably Selfish"

I WAS very glad to note that "Indicator" agreed with the points that I raised in my letter published in your issue of August 25, but I should like to make it clear that my attitude is not "dog-in-the-mangerish" although it is, I think, justifiably selfish.

I have no objection to other people getting training at a cheap rate for which I had to pay dearly, but I feel that I, personally, in company with all others who learnt to fly under the old conditions, will suffer through the formation of the Civil Air Guard.

There must be a large number of pilots who cannot afford to buy their own machines but who could afford to pay for, say, 50 hours' flying per year at the old rates, and these are the people who will suffer.

It really seems most unfair that, having spent a considerable amount of time and money in attaining to a certain degree of efficiency, one should be prevented from using this in the manner that one wishes.

If one had spent the same amount of time and money on becoming a musician it would seem very hard if the Government prevented one from playing for more than 10 hours per year and insisted that even during this time only scales were to be played!

JAMES G. ARROW.

London, S.W.16.

PERSONAL INSURANCE

"Indicator" Challenged: Some Figures Quoted

I NOTICE that in your issue of August 25, your contributor, "Indicator," puts the following post-script to his weekly notes:

"A flying insurance cover at the rate of £7 per £1,000 may seem fairly reasonable until you start using the £1,000. At 3 per cent. this large sum produces the lively income of £30 per annum, and you are, therefore, paying £7 a year to be insured for £30. The insurance companies think that the risk of neck breakage is 4.3 to 1. Dear me; if I thought that flying was as dangerous as all that I'd give it up."

I would suggest, from the figures he quotes, that his conclusion of the accident estimate is completely erroneous.

Taking his figures, it is obvious that the insurance company in question has quoted "odds" of 1,000 to 7 that he will not meet with a fatal accident during the twelve months of the insurance, and the figures of "7" includes their overhead charges and any profit which they may hope to make.

On making this explanation to one of your readers, however, he apparently still did not see the real ratio involved, and I will endeavour further to clarify the position.

Taking the rate of interest of 3 per cent. per annum assumed by your contributor, then the company is asked to risk in perpetuity the sum of £1,000 plus 3 per cent. per annum interest that the insured does not meet with a fatal accident during the year, in consideration of one payment of £7.

It appears that whilst "Indicator" anticipates retaining in perpetuity for the benefit of his estate his capital of £233 6s. 8d. (which at 3 per cent. would produce £7 per annum) he expects the insurance company to give up in perpetuity the sum of £1,000 and the interest thereon.

I would point out that if he were to give up his capital sum of £233 6s. 8d. as a premium, the amount obtainable from the insurance company in the event of a fatal accident in the year of insurance, at the rate he quotes, would be £33,333 6s. 8d., which at 3 per cent. would produce approximately £1,000 per annum in perpetuity.

I still wonder, however, why "Indicator" troubles to take this form of policy. The cause of one's death is something which, obviously, no one can foresee, and a comprehensive life policy guaranteeing payment from any cause, including flying, is surely more appropriate. [*Cont. overleaf*

Admittedly, the annual outlay is higher, but, provided the premiums are maintained, the sum insured must be paid to the insured or to his estate, whereas with a policy covering, for instance, death by accidents through flying, no return whatever will be made by the insurance company unless the insured's death occurs from that cause.

It is sometimes objected that the extra rates charged by life insurance companies to cover flying are too high, but that some additional premium should be required to cover flying risks is obviously reasonable.

Some Examples

The following indications of the annual extra premiums for the ordinary type of life or endowment insurance required by one of the biggest of the British life insurance companies may be of interest to your readers:—

(a) For members of light aeroplane clubs, and members of the Civil Air Guard:—10s. per cent. on the sum assured, for a period of ten years.

(b) For members of the Royal Air Force Reserve and Auxiliary Air Force (any extra premium limited to five years):—

(1) 20s. per cent. in respect of Squadron Leaders or lower ranks.

(2) 10s. per cent. for Wing Commanders, Group Captains and Air Commodores.

(3) No extra for higher ranks or for ground staff undertaking only occasional flying as passengers.

(c) For members of the Royal Air Force (any extra premium limited to five years):—

(1) £4 per cent. for airmen pilots, cadets, acting pilot officers or pilot officers.

(2) £3 5s. per cent. for Flying Officers.

(3) £2 per cent. for Flight Lieutenants.

(4) £1 per cent. for Squadron Leaders, specialist officers (not intending to transfer to general duties) and naval observers.

(5) 10s. per cent. for Wing Commanders, Group Captains or Air Commodores.

(6) No extra for higher ranks or airmen whose duties involve only occasional flying as passengers.

(7) No extra for personnel who are other than General Duties Branch (except as previously mentioned).

(d) Fleet Air Arm.—The extra premium required would be that applicable to the corresponding rank in the Royal Air Force.

(e) Commercial aviation, including air transport, flying for hire, test pilots and flying instructors in the United Kingdom; private flying (e.g., owner of aeroplane holding an "A" licence) and members of gliding clubs.—20s. per cent. extra for ten years.

(f) Private flying for owner of aeroplane not a pilot, 10s. per cent extra for ten years.

(g) Imperial Airways pilots would be individually rated.

Individual Cases

Of course, the circumstances of individual cases might necessitate some alteration in these extra premiums, but in general they may be taken as an accurate indication of the additional premiums required and it will be seen, for instance, that the extra in respect of a member of the Civil Air Guard would normally only amount to an addition at the rate of tenpence per month for every £100 assured.

In the event of an assured permanently giving up flying before the expiry of the above-mentioned periods, no further extra premium would be charged, subject, of course, to his notifying the insurance company.

I am aware that a number of the life companies do not give such reasonable terms as these, but where an existing policy-holder is unable to get similar terms from his own company, he could, in many cases, cease paying premiums to them and arrange for his existing policy to be proportionately reduced according to the number of premiums already paid.

He would then be in a position to use the amount thus saved in effecting a new insurance elsewhere on a more favourable basis.

S. F. LYDON.

London, E.C.4.

["Indicator" remarks: "Interesting—and I hoped that my postscript might start a riot. In fact, I am still unconvinced about the odds, but there, I never was designed to be a financial magnate or a bookmaker. Probably we are both wrong: the odds are neither 4.3 to 1 nor 1,000 to 7, but are on a sliding scale. After five years of accident-free flying I have paid £35 while the insurance company is still only risking £1,000. But the profession of the insurer, like that of the lawyer, is too complicated for the ordinary mortal, who just pays and looks as pleasant as possible."—ED.]

THESE TRICYCLES

Mr. Dimock Speaks His Mind—and Misses the Point

THE article in your last issue dealing with strip aerodromes and tricycle undercarriages provokes me to speak on the subject, as the article appears to me to be written with a lack of experience.

As you mentioned recently in your columns, this club has built and uses an aeroplane with a tricycle undercarriage, and therefore I think that my remarks on the subject, in the light of experience gained, will be of interest to the writer of the article and to any others who are thinking of designing an aeroplane with a tricycle undercarriage.

In the first place, a tricycle undercarriage simplifies the art of landing to an almost incomprehensible degree, and it does not really matter whether the aeroplane is landed into wind or across wind. The only thing that matters is that the pilot should land the machine without *much* drift. This is an extremely simple matter. It merely means that the pilot should put on rudder to turn the machine out of wind still more for the second before and while landing, and it is quite normal here to land so that the run brings the aeroplane up to the hangars where the next member is waiting.

I have flown several tricycle undercarriage machines, but only a few with a steerable front wheel. Our front wheel is steerable, being connected with the rudder pedals, and I can say without hesitation that this is the ideal arrangement. The lock is so good that the machine can describe a circle well within its own span. I have no doubt that our machine is the only one which has been used by numbers of inexperienced pilots—a crucial test for any aeroplane.

The tricycle Drone mentioned by Mr. Dimock in his letter.

In my opinion it would be far easier for the pilot to judge the amount of drift and correct it with the rudder than to have to judge the preset angle of the wheels. Another point against presetting the angle to allow for drift is that it would make one more knob or handle for the attention of the already overburdened pilot.

The paragraph on our tricycle undercarriage machine in your recent issue was written in a rather deadly sarcastic manner, and I would like to ask you, sir, and your able assistants, to endeavour to be less sarcastic about Drone aeroplanes. Everybody knows that a Drone is very easy and safe to fly, but why should one not seek to improve even the best? In this case the experiment has proved successful and well worth the time and labour put into it. Even if Drones are not permitted a certificate of airworthiness, they have proved themselves very airworthy, and have given many hours of enjoyment to people who fly for the love of flying. I am sure I am not speaking for myself alone when I say that it would be greatly appreciated if you could write with a little less bias on the subject of Drones and their improvements.

Ely Aero Club. H. R. DIMOCK.

[Mr. Dimock tends to talk through his once-well-known hat. By way of a start, it may be said that the writer of the *Flight* article in question has flown almost every tricycle type which has been available over here.

Of course, one can counteract drift by rudder and ailerons, and this is the principle of all cross-wind landings. But it is one thing to apply the necessary crab side-slip to a light aeroplane and quite another to attempt it with a large transport type. With a normal type of tricycle undercarriage the allowance for error in such a manœuvre can be considerably greater and no one denies that the tricycle, by itself, provides part of the solution of the problem of using strip landing grounds.

As for the anti-Drone "bias," all we can say is that *Flight* has probably, at one time or another, and in the interests of ultra-light development, devoted more space to this type than its importance has justified. The only trouble with the Drone is that it is difficult to go anywhere with it.—ED.]

R.A.F. UNITS VISITED

A flight of Vildebeests. Note the angle at which the torpedoes are carried.

No. 42 (TORPEDO BOMBER) SQUADRON

By MAJOR F. A. de V. ROBERTSON, V.D.

(Illustrated with "Flight" Photographs)

SOMETIMES newspaper correspondents in Spain report that Barcelona or some other city suffered from the dropping of an "aerial torpedo." What is really meant by that expression is an especially heavy bomb, but the impression made on lay readers is rather hard to guess. A torpedo dropped from the air is quite a different matter from a large bomb. As readers of *Flight* know, torpedoes dropped from aircraft are used for attacks on ships, not for the destruction of cities.

There are many questions on air tactics which cannot be answered with confidence in peace time; only experience in war can provide an answer. Much has been written and spoken about the probable effect of bombing on warships, but perhaps nothing is more incalculable than the precise value of the torpedo from the air. The Fleet Air Arm is familiar with its use, for it boasts ten squadrons of torpedo-spotter-reconnaissance machines, but then torpedo-dropping is only one of the triplicate duties of those squadrons. The rest of the Royal Air Force has only indulged in two torpedo-bomber squadrons in the Coastal Command and two in the Far East Command, that is, at Singapore.

Donibristle, on the Fife shore of the Firth of Forth, used to be the home of the torpedo-bomber squadrons of the Coastal Command, but last March they both moved down from there to Thorney Island, which is one of the peninsulas jutting out into the so-called Chichester Harbour, just to the east of Hayling Island. From Gosport to Selsey Bill is a curiously indented piece of coast, just one series of alternate peninsulas (called "islands") and inlets of the sea which are called harbours. By night it must be very easy to identify every spot of that bit of coast from the air, but we may assume that the anti-aircraft defences all along there are correspondingly formidable.

Anyway, in March last Nos. 22 and 42 (T.B.) Squadrons left the Land o' Cakes and took up their abode at the new station of Thorney Island. No. 22 Squadron was once one of the Martlesham squadrons, a paper unit to which some of the Martlesham test pilots were posted for administrative purposes. No. 15 Squadron was another such. But one day, before expansion made excuses superfluous, the Government, anxious to increase our air strength without increasing our air strength, accomplished this contradiction in terms by making Nos. 15 and 22 into real operational squadrons. No. 22 was given the task of torpedo-dropping, and was accordingly sent to Donibristle, whence No. 100 Squadron had departed to join the air garrison of Singapore.

In due course (to be precise, in December, 1936) it was decided to double the torpedo strength of the Coastal Command, so No. 22 gave birth to No. 42. This was done by detaching one flight and proclaiming it as the nucleus of the new squadron. It was brought up to strength by post-

Fixing the "tin fishes." The levers on the trolley raise the torpedo into the carriers under the Vildebeest.

Torpedo attack on a ship: Two Vildebeests have levelled out and are aiming at the vessel, while a third is still diving down from the height at which the approach was made.

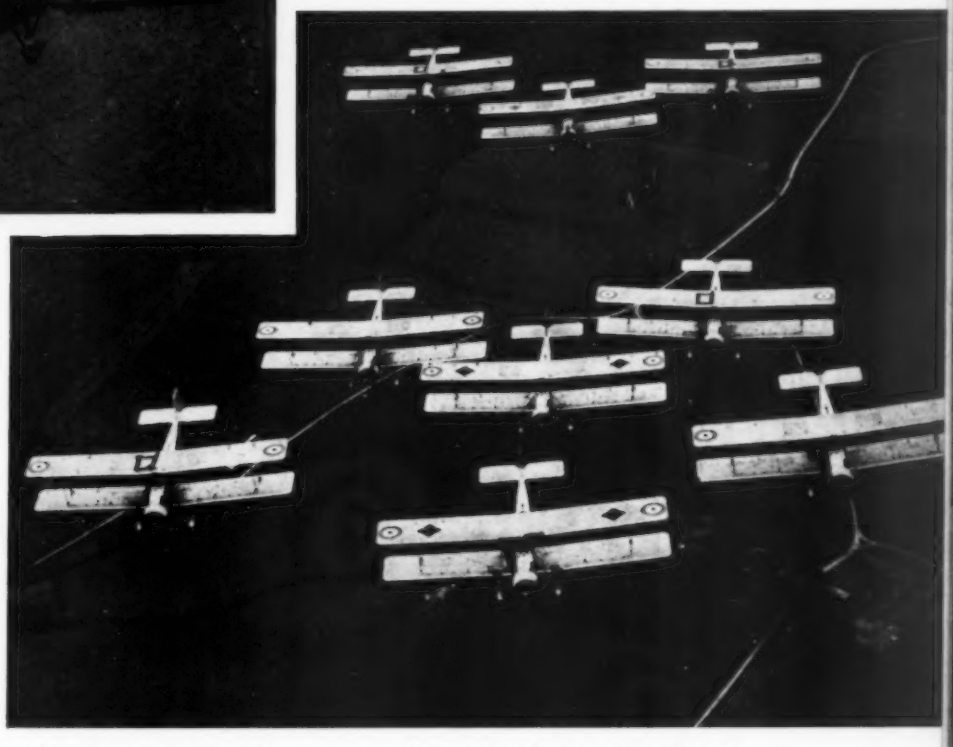
ing to it pilots who had gone through the torpedo course with the Coast Defence Training Unit at Gosport. Consequently there is a close bond between the parent and the daughter squadrons, and when one started on the traditional southward trek from Scotland to England the other followed next day. No. 42 proclaims its Scottish origin by painting a thistle on its wheel-spats.

Now, however, a difference has arisen between the two related T.B. squadrons. No. 42 is equipped with the Vildebeest IV with the Bristol Perseus engine, whereas No. 22 still has the earlier mark of Vildebeest. No. 42 thus becomes the first squadron in the Royal Air Force to be equipped with a sleeve-valve engine. Its experience with this engine is being carefully watched, and so far it can be said that the results are very satisfactory. The performance of the Vildebeest is improved, and the engine has given little trouble in maintenance.

Classical Research

The squadron wishes to commemorate this distinction in its armorial bearings, and all the officers seem to have been rereading Charles Kingsley's *The Heroes* with great care. They talk learnedly about how Hermes (the Romans called him Mercury, you remember) lent Perseus his winged sandals and winged helmet, and how the helmet could make him invisible. The trouble is that it is rather difficult in a heraldic blazon to distinguish between the lender and the borrower of the flying equipment, and it might be thought to show undue favouritism if the squadron escutcheon bore a resemblance to the trade mark of a certain brand of fuel. Nor does the squadron want, when it dives unexpectedly on some passing warship, to be greeted with megaphoned shouts of "Oh! Mr. Mercury, you did give me a start!" Chester Herald is now wrestling with the problem.

If No. 42 Squadron has the distinction of being the first unit with sleeve-valve engines, the two squadrons at Thorney Island share the distinction of being the only professed striking force at the disposal of the Coastal Command. In many of the recent coast defence exercises squadrons of Ansons have played the part of bombers, but that is only make-believe. Ansons are intended for reconnaissance, not for attack. The bomb and the torpedo are the weapons of the T.B. Squadrons, and because they can use the torpedo we must not forget that they are also bombers. The two weapons may often be used profitably in conjunction. The first wave of attack on a warship may be carried out by bombers, either by precision bombing or by dive bombing. This is likely to occupy the attention of everybody on the ship, and to get all eyes and guns pointing upwards. The torpedo machines would come up as a second wave and try to deliver their attack before the guns could be swung into a horizontal position. The pilots dive down to some 25 to 30 feet off the water and at some distance from the ship. Then, for a few critical seconds, they must fly level and straight as they aim their machine at the ship's vitals before releasing the torpedo. If they come too low they may hit the water, which resents such rudeness on the part of an aeroplane, and if they level out too high up the torpedo may be damaged by the fall into the sea. The torpedo is carried below the fuselage at an angle of 9 deg. so that it enters the water more or less nose first, instead of doing what small boys call a "belly-flopper." The short period of level flight while aiming is certainly critical, for if the guns are trained on the machine they might find it an



This striking photograph shows No. 42 (T.B.) Squadron in formation over one of the inlets of the South Coast. This is the only squadron equipped with the Vickers Vildebeest IV driven by the Bristol sleeve-valve Perseus engine.

Not a ghost squadron : Our photographer has caught the formation at a moment when some trick of light on a dull day shows the machines up vividly against the ground. Their usual duties, however, take them over the sea where their silvery paint would not make them so conspicuous.

torpedoes are expensive things, and the authorities do not like them to be lost.

As may be gathered from the above, the work of a pilot in a torpedo-bomber squadron is highly skilled. After leaving their F.T.S., the pilots all go to Gosport, where they are put through an intensive course in torpedo work, at the end of which they join their squadron filled with great confidence in their own ability to flatten out from their dive at the correct height above the water. It is said that once a pilot was seen to spin his wheels on the surface of the sea, which, perhaps, was cutting things a little fine.

Naturally, after this specialist training, pilots usually remain in the same class of squadron for the three years of their short service after completion of their training. Some, of course, go out to Singapore, where life is said to be very pleasant, and that makes a variety. Those who remain in the old country have no complaints to find with the station of Thorney Island.

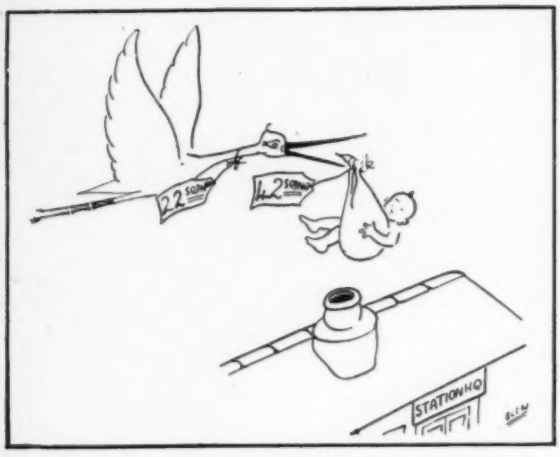
During the coast defence exercises in July, No. 42 T.B.S. was honoured by being chosen as the only unit on the Red defensive side to represent an air striking force. Ansons may have been ordered to play at being bombers in an emergency, but their real work was reconnaissance. No. 42 was able to strike the Blue battleships and cruisers, and it must have had a pretty busy time. For the period of the exercises it took up its abode at Thornaby station in Yorkshire.

easy target. The moment that the torpedo is released the pilot uses all his climb and wiles to get away to a safe distance. Needless to say, if several machines attack a ship from different quarters at the same time, the gunners in the ship have to be very smart in handling their weapons, and everybody on the ship has quite as anxious a time as have the attacking pilots.

A recent acquisition of No. 42 Squadron is a torpedo camera, which corresponds to the camera gun of the fighter and other squadrons. From the photographs taken calculations can be made which show whether the torpedo would have hit its mark. This camera is a great saving in dummy torpedoes, for when they are dropped they have to be recovered, which means lots of work for the boats and marine crews. Even without their war-heads

The Squadron's War Service

In the Great War No. 42 Squadron was one of those gallant Corps Squadrons which, day in, day out, flew their B.E. and R.E.8 machines over the lines on the reconnaissance work which was so essential for the Army. Often they were attacked by German fighters, and then they defended themselves as best they could in an unequal combat; sometimes they had to undertake bombing raids; but they never enjoyed the glamour and excitement which was the normal lot of the fighter squadrons. Seldom, if ever, did a chance come to their pilots or observers of winning a name and a Victoria Cross. Ball, McCudden, Mannock, were all fighter pilots, and so were most of the other air V.C.s, but the Corps Squadrons did equally gallant work in more depressing circumstances. *[Cont. overleaf*



The birth of No. 42 (T.B.) Squadron as depicted by a squadron artist. The infant, however, inherits the fine traditions of No. 42 Squadron in the Great War.

No. 42 Squadron arrived in France in August, 1916, when the Somme attack was in its early stages. Experienced squadrons had been moved down to the Somme area, and the new arrivals from Home took their places in less disturbed parts of the line. No. 42 was stationed at Bailleul. It was equipped with the B.E.2, and its C.O. was Major J. L. Kinnear, M.C.

Air activity on other parts of the line gave indirect help to the squadrons on the Somme, and in September, 1916, a raid by No. 42 and two other squadrons on Quesnoy station blew up an ammunition dump.

Not long afterwards it was decided to bring certain squadrons up to a strength of twenty-four machines, and this was partly effected by taking some machines from other squadrons. No. 42 had to give up some of its machines, but probably it did not much regret the loss of some B.E.s, for presently it began to receive the R.E.8. At the start of the battles of Arras in April, 1917, it had eighteen machines, mostly R.E.8s. At the battle of Messines in June, 1917, the squadron was allocated to the 2nd Anzac Corps. It was then sharing an aerodrome with Nos. 1, 1 (Naval), and 53 Squadrons. A couple of days before the battle started, on June 5, a German machine ignited an ammunition train near the aerodrome, and for three hours the flying fragments prevented any of these squadrons from taking a machine off the ground. But on the opening day of the battle, June 7, an R.E.8 of No. 42 greatly distinguished itself. It was reconnoitring when it was attacked by three Albatros fighters, which shot the R.E. about and put the Vickers gun out of action. But the observer shot one Albatros down in flames and badly damaged another, which, accompanied by the third, decided that this R.E.8 was a regular tartar, and made off to the east.

That evening the staff was ignorant of the position of the 3rd and 4th Australian divisions, and was much worried by its ignorance, so the R.F.C. was asked to find out the junction of the two divisions as quickly as possible. Two machines of No. 42 went out at dawn on the 8th, and signalled to the Australians to show light signals. They complied, and the staff promptly got this all-important information.

In Italy

In November, 1917, No. 42 Squadron was ordered to Italy as part of the succour which the French and British were sending to the Italians after their heavy defeat at the hands of the Austrians and Germans. It was at first stationed at Istrana aerodrome, but moved to Grossa on December 17. All through December it was hard at work, not only reconnoitring but also bombing. Its patrols were not escorted by fighters, but it never lost a machine during its four months in Italy. On the other hand, it so bombed the aerodrome of San Felice that the enemy evacuated it. No. 42 left Italy on March 14, 1918, and returned to France.

During the last great German advance, in March, 1918, No. 42 and four other Corps squadrons were taken off their usual work and ordered to make low-flying attacks on the advancing German infantry. Normally this was the duty of the fast fighters, and the risk run by the slower R.E.8s was obviously greater. But No. 42 Squadron was one which would undertake all war duties with equally fine spirit, and its reputation was high when the Armistice brought the four years of fighting to an end.

Some pilots of No. 42 (T.B.) Squadron. Left to right :—Sgt. N. B. Harvey, Sgt. F. D. Flinn, Sgt. G. S. Forbes, Sgt. G. S. Turner, P/O. G. S. P. Rooney, F/O. W. H. Cliff, F/O. J. S. Tupholme, F/O. D. B. M. Wright, F/O. A. Hibberd, Sqn. Ldr. G. C. Bladon

PRIVATE FLYING

SEPTEMBER MORN : The first day of Air Guard instruction gave the news photographers their opportunity, and the improbability of the poses was only equalled by the futility of the captions. Here, however, is one of the more pleasing efforts, showing Mr. John Kirwan (right) in action with two recruits at Hanworth.

Topics of the Day

By Way of a Start

ON the whole, more clubs have started in on the Civil Air Guard business than might have been expected by anyone with a knowledge of such affairs. Probably the general public will feel that it is all very disappointing, but in the circumstances one could hardly expect more than 30 per cent. of the clubs to be in a position to make a start, or that these clubs would be able to deal, in each case, with more than a very small proportion of the total number of applicants.

It would probably be safe to say that not more than 800 pupils in the whole country have either been up for their first instructional flight (if they are very lucky), or been given some general instruction on the ground. The very fact that so comparatively few of the pupils can be got into the air at this stage should, however, mean that the others will receive a far more thorough and useful grounding in the principles of flying than prospective "A" licensees have previously received. This, at least, is a good thing, since so many present amateur pilots know little or nothing about either theory of flight as such, or about the handling of aeroplanes on the ground.

From a cursory examination of the state of affairs at a few clubs, I should say that this C.A.G. scheme is going to require far more regimentation and organisation than is even at present appreciated. The only clubs which have so far made a flying start have gone into the whole matter very thoroughly and in one case, at least, have actually employed an actuary to work out the figures of the thing—for instance, the number of pupils who can be given instruction with the available machines, equipment and licensed personnel.

This business of pouring pupils into uniforms and of organising training minute by minute may appear to be rather painful to the old members who have been used to free and easy methods, but it is, I am afraid, the only possible way of dealing with a situation which is putting some quite well-organised clubs on their backs.

Picking and Choosing

THE very fact that such a small percentage of the total number of applicants can at present receive training has meant that quite a number of clubs are picking and choosing with quite ruthless determination. In other words, if only 100 of the 1,000 applicants at any particular club can now be dealt with, this 100 is going to consist of the pick of the bunch, and of those who can train all day and any day—which is hard on some of the others, but quite inevitable. At least this careful selection will mean that the initial trainees will be above the average in talent and be able to get down to some solid work, and that there will consequently be fewer crashes in the early part of the scheme than one might have originally expected.

Many of the bigger clubs are still marking time. The reasons for their slowness off the mark are many. In some cases the necessary forms have not turned up, and in others, even, the secretaries are still counting the cost in cash and prestige. In the end probably every one of them will go into the scheme, but will undoubtedly find that it is almost impossible to run the business without the aforementioned regimentation.

Machine Insurance

AT the moment quite the most painful question is that of machine insurance. Additional premiums are being charged at the rate of 50s. for every new member and 30s. for those pilots who are already qualified. The insurance companies feel that there is bound to be a considerable increase in the number of crashes, and that they have, in any case, been subsidising the light aeroplane clubs to no small tune during the past twelve years.

The idea that there will be more accidents of a minor or major character is the product of a simple calculation of chances on a basis of previous figures. Not only will there be far more *ab initio* pilots flying around, but, on an average, every one will be doing more flying.

Rightly or wrongly the insurance companies feel that they have carried the baby long enough, and say that in any case they are not going to make very much, even out of the new rates. By way of sugaring the pill the new premiums will be payable in arrear on the basis of a quarterly declaration, so that the clubs will be assisted in their mathematics. The new premium amounts to less than 5 per cent. of the subsidy payable for each member.

Seeing both sides of the difficulty enables one to feel sympathy for both. For some clubs the new premiums are nothing more or less than they deserve. Others have had a remarkably good accident record during the past few years, and a flat rate of increase is certainly unfair to them. The secretaries concerned feel that with carefully selected instructors and the same types of aeroplanes there is no reason at all to suppose that the proportion of accidents will be any greater than it has been in the past. All their efforts to keep a good safety record have been wasted, and the very best clubs are now put on the same footing as those which have regularly wrecked aeroplanes every month or two for years.

There is, in fact, a minor mutiny going on, and a few of the larger clubs may even decide in the end to take the risk themselves. With ample capital and a sufficiently large fleet it may be cheaper to do so, but there is always the unpleasant possibility that one club or another will suffer a really bad year. The insurance companies are, after all, in existence merely to spread such risks over a large number of people. The premium which you pay is simply the computed risk for the average, and if you have a good year you are paying either for somebody else's bad year, or for the possibility that you will have an equally bad one some time in the distant future.

If I were secretary of a "good" club I should feel mutinous. As it is I can comfortably sit on the fence and watch the progress of the revolution. INDICATOR.

Private Flying

FROM the CLUBS and SCHOOLS

LONDON

ONE hundred hours and twenty-five minutes made up the flying total for last week. Mr. B. M. Watt made his first solo flight and Mr. G. I. A. Spittle completed his "A" licence tests. Four new members joined.

ROMFORD

During the fortnight ended September 4 club machines put in 68 hours' flying. C.A.G. instruction started according to plan on September 1.

MARSHALL'S

Pupils of Marshall's Flying School last week flew to Devon, Oxford, Rochester and Hatfield, and for the week ended September 3 a total of 85 flying hours was achieved. Mr. Cummins was a new pupil.

CINQUE PORTS

The flying time for Cinque Ports Flying Club for the week ended September 4 amounted to 74 hours. Six new members joined, including Sir Derwent Hall-Caine and Lord Mornington. Mr. Rivers-Bulkeley passed his "A" licence tests and Mrs. Rivers-Bulkeley made her first solo after only four hours' dual.

BROOKLANDS

Six Tiger Moths took part in the Shoreham Dawn Patrol but the pilots had no luck there. (Altogether the defence seems to have been good.—Ed.) Mr. Jack Sewell has qualified for his "B" licence and Messrs. Mellboom and Connor made first solos. The week's flying time amounted to 100 hours.

HANWORTH

The first section of the Civil Air Guard applicants are now at work, 120 starting their training last Thursday. Sir Charles Wrench won the Aircraft Exchange and Mart Challenge Trophy for proficiency in general flying. The trophy was presented by the Mayor of Twickenham, who killed two birds with one stone by officiating at the opening of the new club house on Wednesday, August 31. The Aeronca was demonstrated at Leicester and Nottingham during the week. The flying total put up last week was 150 hr. 40 min.

READING

On Tuesday, August 30, the club members foregathered for a little farewell party for F/O. Kimpton. Mrs. Eugster made the presentation to him from the members and also gave the Barnes Challenge Cup, appropriately enough, to Mr. Eugster. In the competition for this trophy Mr. C. C. Dash was second and Mr. Ralph Hope third. Flt. Lt. Hilton has joined the club as chief instructor with F/O. Porteous as his assistant. Mr. R. Hobbs did not get a free breakfast at the Shoreham dawn patrol. Several "A" licensed Air Guards have started their ten hours' flying and non-qualified Air Guards are preparing themselves.

STRATHTAY

During last month 80 hours' flying was recorded by the club at Perth. This, in view of the recent high winds, is a good average. Messrs. McLean and Carmichael obtained "A" licences and Mr. A. C. Melville made his first solo. Flying under the C.A.G. scheme has started.

C.A.S.C.

Last Sunday three machines made a round trip from Cambridge to Clacton and Southend, and the flying total over the week-end was 26 hr. 10 min. Three new probationary members and one full member joined the Corps. With the start of the C.A.G. scheme it is possible that the Kent Squadron will be re-formed to operate from a new aerodrome.

BARTON (BEDS)

C.A.G. instruction started at 8 a.m. last Thursday and the excellent weather has permitted plenty of *ab initio* flying. A dance was due to follow the general meeting yesterday. The aerobatic displays which should have been held on Sunday of last week will be given on September 17. Messrs. G. W. Dicker and W. L. Stoddon obtained their "A" licences and nine new members joined.

REDHILL

Although six machines from Redhill went to Shoreham dawn patrol no one was fortunate enough to qualify for a free breakfast. The first batch of seventy Air Guards have started training. For the week ended September 3 a total of 129 hr. 40 min. was flown and Messrs. H. Campbell, E. J. Wicht and P. B. Hill made their first solos. Mr. J. J. Allen completed his "A" licence tests.

BENGAL

Although one of the two machines belonging to the Bengal Flying Club is under repair, a total of 116 hr. 10 min. flying was put in for the month of July. A display and gymkhana, held in honour of the visit of H.E. the Governor of Bengal and Lady Reid, was given on July 30. Five machines took part, four of these being loaned by outside interests. Capt. F. H. Rowan and Mr. P. R. M. Barrington passed their "A" licence tests and Mr. D. A. Bruce made his first solo.

PENANG

An improvement in the time for dual instruction was apparent in the figures for the flying in July and 150 hr. 50 min. covered the total for the month. The Perak Flying Club Rally was held during the last week of the month and four machines from Penang participated. The Rally started on Saturday evening when the Penang and Perak clubs endeavoured, not entirely successfully, to defend Ipoh against an "attack" by the Singapore and Kuala Lumpur clubs. Three inter-club competitions, among other activities, were held on Sunday, and in these Penang was successful in making the best score and thus holding the challenge cup for a year. Mr. C. W. Lyle went solo, and among the visitors were three Vickers Vildebeests, of No. 36 Squadron, and two new Wearnes machines piloted by Capts. Pugh and Beresford.

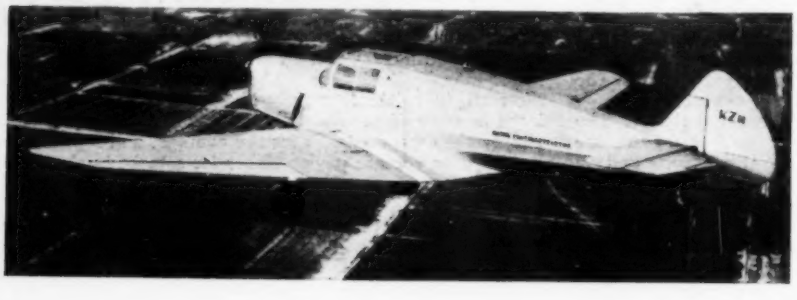
ORGANISATION and OVERALLS

WITH the help and co-operation of the flying clubs, the C.A.G. commissioners propose to set up an area organisation under which sub-commissioners will look after C.A.G. members in the different club groups, with a local section officer for each club. The sub-commissioners will be asked to give their services in a voluntary capacity, and each of the present five commissioners will be given a territory in which to make selections. Within the next two months it is hoped that all the clubs will receive a personal visit from the person responsible for each particular area in order that the various problems may be discussed and advice given.

The first meeting of the commissioners (less Mr. Lindsay Everard, who was abroad) was held at Ariel House on Monday, August 29, and at this meeting was considered the number of C.A.G. pupils who could at present be trained. The next meeting will be held on September 15.

Not unnaturally the commissioners attach considerable importance to the maintenance of a high standard of order and efficiency, and to assist in this matter a distinctive flying uniform is considered necessary. This will consist of flying overalls of an approved design with a distinguishing badge, and will only be worn when members are engaged in C.A.G. activities.

Calculations have been made of the number of new machines which are likely to be required during the next six months by the various clubs. The unofficial figures are 65 in the larger class and 22 in the below-1,200 lb. class. Last week only 28 clubs had stated their requirements.



THE DANISH KZII in the air near Copenhagen. This machine is fitted with a Cirrus Minor engine and has a cruising speed of 110 m.p.h. In general layout it is rather similar to a scaled-down Monarch, though the fuselage in this case is of welded steel-tubing. The KZII is the first result of serious internal design and production of aircraft in Denmark. **Further details appear on p. 210.**

C.A.G. INVADER

Some Impressions of the New Aeronca Chief : A Typical American Miniature

"Flight" photograph.

BOTH in flying characteristics and layout the American private-owner type is still very different from those of the typical English machine. Curiously enough, too, the features of the American car, in comparison with that built in England, are very similar in a distinct but quite undefinable way. In the larger classes the American machine has been developed around a power unit of a size which would normally be hopelessly uneconomical over here, and the comparatively new series of lightweights from the same country are tending to follow similar lines, with full-scale control systems and comfortingly familiar interior layouts.

There are three American lightweights available over here which are suitable, in weight and general features, for C.A.G. use. These are the Piper Cub, which is handled by Mr. Walter at Hanworth; the Taylorcraft, which is being demonstrated by Mr. Prentice at Ipswich; and the new Aeronca, the agents for which are Aviation Equipment and Export, Inc., of 14-16, Regent Street, W.1.

All are interesting, the last-named because it is the first to be flown in this country with one of the new 50 h.p. Continental flat-four engines. Theoretically, this engine merely gives ten more horse-power than its forerunner, but in practice it is a very much more useful engine. Because its revolutions are low as aero engines' speeds go—1,995 r.p.m. maximum and 1,700 r.p.m. cruising—the airscrew efficiency at low flying speeds is high and the acceleration, take-off and climb effects are such as one might expect with a unit of much higher power. The new engine, save for the fact that it is again a flat-four, is also radically different in design, with overhead valves and hydraulic (self-adjusting) tappets.

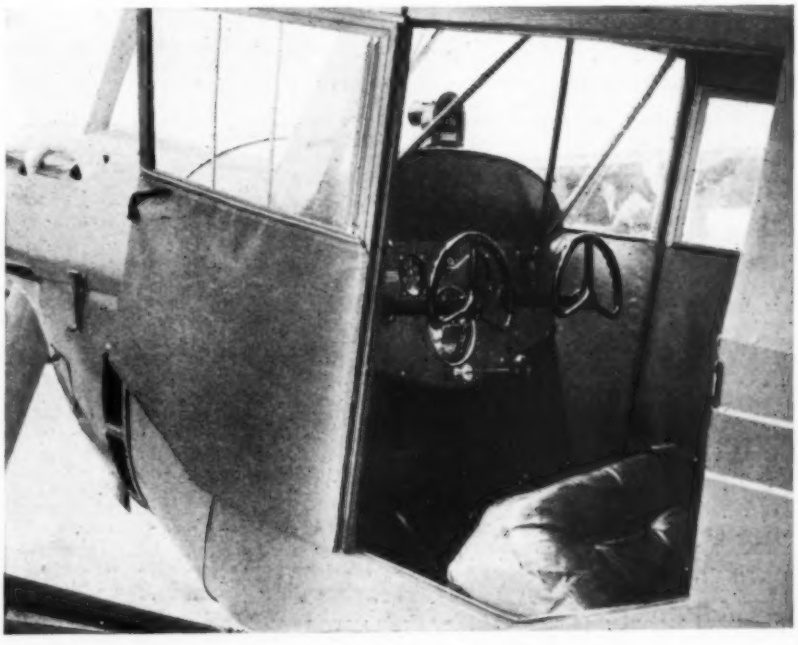
In the Aeronca this new engine is completely cowled-in with a proper "built-in" cooling system, and this cowling gives the nose of the machine a clean form which probably helps quite a lot in providing the machine with a performance which, on such a low power, is quite remarkable when allied to an exceptionally low—almost too low—landing speed. The official cruising figure is 90 m.p.h. and A.S.I readings, in practice, suggest that this is not exaggerated.

So far as the cabin layout is concerned the Chief may adequately be described as a miniature Stinson. The ailerons are wheel-controlled, with the operating mechanism and column hidden behind the dashboard, leaving the floor space clear except for the rudder and brake pedals. It is, in fact, quite possible to change seats while flying solo. The plunger type throttle is centrally placed, though it is possible to work it with one's left hand while sitting on the left side. The trimming crank is in the roof.

Altogether one might justifiably say that the control system, delightful though it is for those who have had previous experience of wheels and right-hand throttles, will offer the only point of criticism from the club members' angle. The *ab initio* pupil will probably have less difficulty than with the more conventional layout, but he will certainly not find it so easy to transfer, in due course, to an orthodox machine. The pupil who has learnt on conventional types may require about an hour's dual to become accustomed to it. One is not saying that this control arrangement is anything but more natural than the usual one, but merely that, over here, it may be a slightly unhappy feature of an otherwise suitable machine. In fact, the new Aeronca will provide excellent training for pilots who are going on to larger machines with a similar layout and side-by-side seating.

In comparison with earlier American types of a similar kind, the machine is tremendously improved. The cabin is really roomy for two normally sized individuals, and there is plenty of head space. The sliding windows on each side can be kept open in hot weather without causing any uncomfortable draught and the one-piece windscreen remains properly transparent in rain. The view on the ground is not perfect, though it is possible to see out on each side with a little neck-stretching. Once in the air, however, the top of the cowling is very well below the horizon. There is a door on each side and quite a reasonably capacious luggage compartment immediately behind the rear squab.

Nothing could be easier to fly in the ordinary way. The machine is thoroughly stable in all axes and will turn with moderate accuracy on either the ailerons or the rudder alone. During the take-off very little rudder correction is necessary,



The control layout of the new Aeronca is unconventional though interesting by English standards. There are three major instruments, one covering engine performances (including an oil-temperature gauge), and two others for airspeed and altitude. There is a primer on the left—a useful and unusual feature in small aeroplanes.

"Flight" photograph.

Private Flying

The layout of the wing-struts, undercarriage, cabin and quickly detachable cowling, is shown in this photograph of the Chief. There is a door on each side of the cabin.

and the run is so very short that it is impossible to imagine any difficulties. The fore and aft trim is carried out by means of a tab in the elevator, and the crank movement involved must be thought out until one has become accustomed to the machine. With two up there is ample trimming range, but with only the pilot aboard the natural hands-off gliding angle, with the trim wound right back, is a little steep unless the pilot is fairly weighty.

The machine side-slips with commendable verve at all speeds, and for small field approaches it is possible to hold quite a steep slip at an airspeed of 50 m.p.h. or less. This, too, is the best gliding speed. If one comes in at, say, 60 m.p.h. the hold-off is a trifle prolonged, and the change in the feel of the fore-and-aft control is somewhat marked as the speed comes down. At a certain point this control becomes lighter, while remaining almost equally effective, and the result is quite invariably the pulling of a quick pint or two while the pilot accustoms himself to the new circumstances.

The last part of the approach and the landing may best be described by saying that, though it is difficult to pull off a really good landing, it should be impossible to make a really bad one. The elevator control is just too powerful at low speeds and the landing speed itself is so low that one is inclined to attempt a premature three-pointer. There is, however, so much reserve buoyancy that one can do almost anything even at 40 m.p.h., and still finish up with the machine properly and firmly placed on the ground—more or less at a standstill if there is any wind at all.

The statement that it is impossible to make a really bad landing is made as a result of due experience. When I first flew the machine the carburettor setting was incorrect, and at any air speed below 60 m.p.h. it was necessary to use some throttle to keep the engine going. The result was that either the landing process was upset by last-minute throttle manipulation or was considerably prolonged because the throttle was left open. A really good landing in such conditions is virtually impossible. One may also add that in these circumstances the undercarriage was tested and found adequate to deal with mediocre landings.

Later on, when the carburettor had been duly attended to, it was possible to discover just how slowly and accurately the machine could be brought in. Certainly, the Chief can be considered as an excellent small-field type for the pilot who knows it. The braking system is controlled in the usual American way, through a pair of heel pedals below the rudder pedals. This, again, requires practice for accurate operation, but the knack is soon learned. No parking brake is provided and this fitting is missed when attempting to start the engine single-handed; even on a small throttle opening the machine, fitted as it is with a tail wheel, may start a gentle, if harmless, roll.

The structure of the Chief is conventionally American, with a welded steel fuselage suitably faired by means of ply-wood and stringer-supported fabric, and two-spar fabric-covered wooden wings. H. A. T.

AERONCA CHIEF

50 h.p. A. 50 Continental Engine.

Span	36ft.
Length	21ft.
Weight empty	650 lb.
All-up weight	1,130 lb.
Maximum speed	100 m.p.h.
Cruising speed	90 m.p.h.
Landing speed	32 m.p.h.
Rate of climb at sea level	550ft./min.
Surface ceiling	14,000ft.
Cruising range	250 miles.
Price	£498.

Concessionaires: Aviation Equipment & Export Inc., 14-16, Regent Street, London, W.1.

At Nottingham

VOLUNTEER Reserve and Air Raid Precaution recruiting shows were the main features of the display which was organised by the Nottingham Flying Club at Tollerton last Sunday. This had been put off from the previous Sunday, when the weather was so bad that not only were the visiting machines unable to get through, but flying of any but the transport kind was impossible at the aerodrome.

Certainly, the recruiting campaign, if such it can be called, could not have been carried out more efficiently, though the A.R.P. demonstration was a trifle slow and, because most of it took place on the far side of the aerodrome, somewhat difficult to follow. In due course six Battles, carrying one large bomb, pulverised the castle, which had already been gassed. There was excellent Service support, with formation flying and synchronised aerobatics by Gladiators from No. 72 (F) Squadron from Church Fenton, demonstrations by a Bristol Blenheim, a Fairey Battle and an A. W. Whitley heavy bomber, as well as a really outstanding display of individual aerobatics with a Hart Trainer by Flt. Sgt. Curlew, one of the instructors at the Tollerton Reserve School. This, we believe, is the only one in the country to be operated by a club. No doubt in order to remove the necessity for ballasting, Flt. Sgt. Curlew flew the machine from the rear seat. Apart from beautifully executed but fairly conventional aerobatics, he also did two or three turns of an inverted spin—a manœuvre in which the personal discomfort was probably not appreciated. By way of showing what even the poor benighted amateur can do, Mr. Simons had previously put up a very creditable show with one of the club's Cadets and Mr. Collins had performed in his frighteningly safe manner—trailing wing tips and climbing and diving at absurd angles—with his Drone from Rearsby.

The crowd was immense—a fact which suggests that much too little display flying had been seen at that part of the world in recent years. When we left in the Intava Vega Gull the crowd was still ready for more.

The Cardiff Race

ENTRIES for the London-Cardiff race—details of which were given in last week's issue—can still be accepted tomorrow morning, September 9. The race will be run on Saturday.

Danish Medium-weight

APART from the Taylor Aircraft Company's subsidiary in Denmark, another firm, Skandinavisk Aero Industri, has recently been formed for aircraft production. Some time ago they introduced a single-seater under the type number KZ I, and now they have produced another machine, the KZ II, which is a cabin two-seater with a Cirrus Minor engine. Demonstrations have been made in various parts of Scandinavia, and this machine is now in quantity production at Kastrup airport, Copenhagen.

The KZ II is of conventional modern design with a ply-covered two-spar wing and a fabric-covered steel-tube fuselage. The important figures are as follows: Span, 34.4ft.; length, 24ft.; weight, empty, 1,000 lb.; payload, 660 lb.; maximum speed 125 m.p.h.; landing speed 45 m.p.h.; rate of climb 780 ft./min.; and range 690 miles. In Denmark the price works out at the equivalent of about £800.

RALLY AT DINARD

Some of the visitors, military and otherwise take it easy inside and outside the official marquee.

NOWADAYS, with so much stress laid on military needs, it is customary, both here and abroad, for the Air Forces to support ordinary flying meetings very well indeed. The flying display at Dinard on August 28 was very largely of military interest, and one or two of the events reminded the onlooker of the shows which were put up by the French Air Force at the Zurich International meeting last year.

For instance, Capt. Fleurquin led four other pilots with their Morane 225s in a typically dashing aerobatic show in which the machines, which were fitted with inverted-flying fuel systems, spent a great deal of the time on their backs. Additionally, Capt. Fleurquin gave individual aerobatic displays, and another pilot, Capt. Amouroux, with a Romano 82, gave a similar show. The latter was the previous C.O. of the d'Etampes school of which Capt. Fleurquin is now in charge. By way of a change from the type of event which is normally seen in this country, six parachutists leapt from a LeO 20 and Morane 315s, and the aerodrome was duly attacked and defended. There were formation flying events in one of which the pilots were given their orders by radio telephony in the modern style.

Although the entrants for the Rally had nothing to do after they had arrived but to watch the flying display and to attend the customary dinner in the evening, most of them were only too glad to stay on the ground, since they had been in the air, on or off, for two days. The rally prizes were awarded on the basis of passenger-kilometres flown according to the horse-power of the machine used in each case, with a minimum distance of 300 km. The competitors were allowed to start at sunrise on Friday, August 26, and had to arrive at Dinard at any time between 10 a.m. and 1 p.m. on August 28. Arrivals were permitted until 2.15, when the air display started, but were progressively penalised according to their lateness. One British competitor, who shall be nameless, put down, after a tremendous full-throttle drive over the last few hundred miles, at 12.59 p.m., or thereabouts, on August 27, and found, instead of a prize, an aerodrome on which there was no appreciable human life.

Needless to say, the always methodical and energetic German entrants won the event, after the B.W.F. 108s, in particular, and in their usual manner, had covered prodigious distances during the previous two days. The runners-up were the representatives of the French Aero Club. A long way down the list, the first of the seven British entries was that of Flt. Lt. R. C. Preston, who covered something like 4,000 km. in his Vega Gull. Next among the British competitors were the Glass sisters with their veteran Gipsy Moth, which was flown fairly solidly around England before being taken to Dinard. Third was Mr. J. C. C. Taylor with the Shell Hornet, who came down from Inverness via Lympne and Jersey. Other British entrants were: Miss C. R. Learthart, flying her Comper Swift; Miss L. Dillon, with her B.A. Swallow; Miss Susan Slade, with a Puss Moth; Mr. J. H. Crook, with another Swallow; and Mr. R. O. Shuttleworth, who came over in one of his specially modified Desoutters.

ARPIN DEVELOPMENTS

JUST at the moment, as recorded in last week's issue, the prototype Arpin pusher is being used mainly for experiments with the Maclaren undercarriage. However, the normal flying tests have been very satisfactory, though it has been found, as expected, that the engine which was fitted for the purpose of these tests was hardly suitable for serious work with two people aboard.

M. B. Arpin and Company's immediate programme involves the installation of a Cirrus Minor engine in the machine. The effect of this change on its performance will be that the top speed will go up to 115 m.p.h. and the cruising speed to a figure just over 100 m.p.h. As the airscrew efficiency on the climb will be somewhat lower for the Cirrus than for the present Salmson engine (because of the increased r.p.m.), the rate-of-climb figure requires a little more investigation. Preliminary calculations indicate that this will be something more than 800ft./min.

One point about the Arpin, which was specially designed for training work long before the C.A.G. scheme had even been seriously thought of, is that the tricycle undercarriage has an exceptionally long wheelbase and wide track. The respective figures are 10ft. and 8ft., and the result is that, quite apart from the natural directional stability of the tricycle as such, the Arpin is very stable and comfortable while taxying at high speed. During tests by Mr. Maclaren the machine was motored along the ground at speeds up to 60 m.p.h. at Luton aerodrome without showing any signs of loss of control or of serious discomfort for the occupant. Needless to say, the pusher field of view makes this taxying speed more reasonable than it might be with a conventional layout.

"Flight" photograph.

OUT AND ABOUT: The Chrislea monoplane has now done quite a lot of test flying in the hands of Mr. Dawson Paul and appears to be well up to expectations in general performance. This machine is a side-by-side seater cabin monoplane with a Mikron engine (for which, incidentally, the Chrislea people are licensees) and every effort has been made in it to produce a machine possessing a good view and safe flying characteristics with a normally conventional layout.

SERVICE AVIATION

Royal Air Force and Official Announcements: — *Fleet Air Arm News: Military Aviation Abroad*

Long-range Flight's Plans

TOWARDS the end of this month the non-stop flight along the England-Australia route by the Wellesleys of the Long-range Development Flight, is scheduled to take place.

It is almost certain that the non-stop section of the flight will be either between England and Singapore or between Egypt and Australia. As conditions, both meteorological and local, in Egypt make this time of the year suitable for such a flight it is possible that the attempt will start there. If this is the case, the flight, successfully completed, should eclipse the non-stop journey achieved by the Russians when they flew 6,305 miles non-stop from Moscow to California, via the Arctic. The distance between Egypt and Australia is approximately 8,000 miles.

Balloon Squadron Appointments

IT was officially announced last week that Lord Ventry has been appointed honorary Air Commodore of No. 902 County of London Balloon Squadron, and Mr. E. G. Dixon, of Woolwich, honorary Air Commodore of No. 903 Balloon Squadron.

The seventh baron, Lord Ventry, who is 40, served in the war as a Subaltern in the Irish Guards. He was wounded and later transferred to the Royal Air Force.

Invalided Airmen

AS from June 22, 1938, the effective date of discharge of an airman invalided from the service will be deferred for 28 days (but in no case beyond the normal date for termination of the airman's regular engagement), and during that period he will be regarded as on leave and subject in all respects to the regulations for a serving airman. .

Accountant Officers' Dinner

AIR CHIEF MARSHAL SIR CYRIL NEWALL (Chief of the Air Staff), Air Marshal Sir William Mitchell (Air Member for Personnel), Mr. H. W. Clothier, C.B.E. (Director of Accounts, Air Ministry), and Mr. F. W. N. Sibley (Deputy Director of Accounts, Air Ministry), will be the principal guests at the R.A.F. Accountant Officers' Third Annual Dinner, which will be held at Grosvenor House, London, on September 24. Group Capt. H. J. Down, C.B.E., will preside.

Unit Badges

HIS MAJESTY THE KING has graciously approved the undermentioned badges and mottoes for the units concerned:—

Unit.	Badge.	Motto.
No. 21 (Bomber) Sqdn. ...	A hand erased at the wrist, holding a dumb-bell.	Viribus Vincimus.
No. 30 (Bomber) Sqdn. ...	A date palm tree	Ventre à terre.
No. 108 (Bomber) Sqdn. ...	An oak leaf...	Viribus Contractis.
No. 211 (Bomber) Sqdn. ...	A lion disjointed, ducally crowned.	Toujours à propos.
No. 224 (General Reconnaissance) Sqdn.	On a rock a tower entwined by a serpent drinking from a lamp therein.	Fedele All'Amico.
No. 3 Flying Training School	An eagle collared, wings elevated and addorsed, holding in the dexter claw a torch.	Achieve.
School of Aeronautical Engineering.	A cog wheel	Knowledge is power.

Wireless Branch of the R.A.F.V.R.

THE Air Ministry is forming a radio branch of the R.A.F. Volunteer Reserve and hopes in the first instance to enroll seven thousand men with G.P.O. transmitting licences. They will be trained, mostly at their own homes, under the Director of Signals at the Air Ministry and a small staff under him. Members will have to become proficient in the morse code, and familiar with Air Force language and procedure, which will be effected by broadcasts and correspondence courses combined. They will then be made familiar with R.A.F. equipment, which will be done by affiliating members to R.A.F. stations. It is intended that when air exercises take place members should do duty at R.A.F. units. A specified period of annual training is not proposed at present.

Members will be given a badge after passing a test of six words a minute. Crystals will be issued for transmitters, to be used in the training scheme. On attaining a proficiency of twelve words a minute members will be entitled to a small allowance of 6d. an hour and will go to a unit and take part in training with it. A small travelling allowance will, it is hoped, be granted to members to attend at R.A.F. stations so many times a year. On attaining a proficiency of eighteen words a minute and passing a procedure examination, a grant of £2 per annum will be made towards the upkeep of transmitters used in the training scheme.

Our Practical Under Secretary

IT has been made known that the Under Secretary of State for Air, Capt. H. H. Balfour, has flown a Supermarine Spitfire multi-gun fighter monoplane at Duxford Aerodrome, which may or may not suggest that the first Squadron of these machines is being started there. The Spitfire is unquestionably the fastest standard fighter aircraft in service in the world.

Capt. Balfour flew for about 20 minutes and reached a speed of over 300 m.p.h. His opinion was that the Spitfire is "a very nice aeroplane for an old gentleman" like himself who spent most of his time at an office desk.

A short time ago Capt. Balfour tried the Hawker Hurricane.

Capt. Balfour will be leaving England early in September to visit R.A.F. units in Egypt, Sudan, Kenya, Palestine, Transjordan, Iraq and Malta. His return to England is scheduled for October 7. The tour will be made in a D.H. 86 recently acquired by the Air Council.

Malta Flight

FIVE flying boats of No. 228 (G.R.) Squadron arrived at Gibraltar last Sunday from Pembroke, via Lisbon. They were proceeding to Malta and will return at the end of the month.

No. 228 is equipped with Stranraers.

Pensioners as Reservists

AS a temporary measure R.A.F. pensioners are to be invited to enter Class E of the Reserve. In announcing this measure Air Ministry Orders give the conditions as four years' Reserve service; bounty of £5 on attestation; and liability to recall for service on mobilisation. Pensioners will not be required to undertake any training liability while in the Reserve. Pensioners who are in civil employment under the Air Ministry or are members of police forces, prison services, or fire brigades are not eligible for the Reserve.

No. 19 E. and R.F.T.S.

NO. 19 Elementary and Reserve Flying Training School at Gatwick, managed by Airports, Ltd., which hitherto has only trained for the R.A.F. Volunteer Reserve, will on October 1 commence elementary training of regular officers with short service commissions. There are usually about twenty-eight such officers in a course.

The school will employ for the training of these officers sixteen additional aircraft, nine additional flying instructors, and three ground instructors.

Moves, Formations, etc., of Units

NO. 16 (Reconnaissance) Group will move from Lee-on-the-Solent to Chatham on November 1.

No. 18 (Reconnaissance) Group commenced forming at Lee-on-the-Solent in Coastal Command on September 1, and will move to the R.A.F. Station, Donibristle, on November 1. The composition of this Group will be notified later.

New Elementary and Reserve Flying Training Schools have formed, or will form, as shown below:—

No. 29 at Luton (Beds) on August 1; No. 30 at Derby on September 29; No. 31 for Gloucester and Cheltenham on September 29.

Nos. 106 and 185 (B.) Squadrons are moving from Abingdon to Thornaby to replace G.R. Squadrons which have gone to Leuchars.

No. 48 (G.R.) Squadron is moving from Manston to Eastchurch.

Flying Accident

THE Air Ministry regrets to announce the following accident:—

P/O. Gilbert Prowse French and A/C.1 Clarence Ponting Rushworth lost their lives in an accident which occurred at Mirozai, near Kohat, on August 29, 1938, to an aircraft of No. 27 (Bomber) Squadron, Kohat, India. P/O. French was the pilot and A/C.1 Rushworth the other member of the crew.

AEROBATIC ARSENAL

"*Flight*" photograph.

A production-type Hawker Hurricane eight-gun fighter monoplane taken over the vertical by Flt. Lt. Philip Lucas. Points to note are the ejector-type exhausts, which improve performance, and the revised tail with additional keel surface under the fuselage.

SERVICE AVIATION (CONTINUED)

Royal Air Force Gazette

General Duties Branch

F/O. A. D. Groom (Act. Flt. Lt.) is promoted to the rank of Flight Lieutenant (August 19); Flt. Lt. D. E. Turner is transferred to the Reserve Class A (August 18).

Royal Air Force Reserve

General Duties Branch

Flt. Lt. A. G. Pickering, A.F.C., relinquishes his commission on completion of service and is permitted to retain his rank (July 15).

Royal Air Force Volunteer Reserve

General Duties Branch

Lt. Cdr. A. D. R. Metaxa (R.N., Ret.) is appointed Hon. Squadron Leader (June 9).

Auxiliary Air Force

General Duties Branch

No. 600 (CITY OF LONDON) (F.) SQUADRON.—Flt. Lt. Viscount Carlow is appointed to the command of the squadron and is granted the acting rank of Squadron Leader (July 1); F/O. R. G. Kellett is promoted to the rank of Flight Lieutenant (July 1).

No. 902 (COUNTY OF LONDON) (BALLOON) SQUADRON.—Lord Ventry is appointed Hon. Air Commodore (August 30).

General List

Sqn. Ldr. P. G. Stewart is appointed to the General List in the rank of Wing Commander on relinquishing command of No. 600 (City of London) (F.) Squadron (July 1).

Royal Air Force Appointments

General Duties Branch

Air Vice-Marshal.—H. M. Cave-Browne-Cave, C.B., D.S.O., D.F.C., to H.Q., No. 25 (Armament) Group, Eastchurch, 17.8.38; on appointment as Air Officer Commanding vice Air Comdre. G. B. Dacre, D.S.O.

Group Captain.—Lt. Lloyd, to H.Q., No. 16 (Reconnaissance) Group, Lee-on-Solent, 17.8.38; on appointment as Air Officer Commanding (temporarily) vice A.V.-M. H. M. Cave-Browne-Cave, C.B., D.S.O., D.F.C.

Squadron Leaders.—R. C. Hancock, to R.A.F. Station, North Weald, 16.8.38; for Administrative duties; J. N. D. Anderson, to No. 207 (B.) Squadron, Cottesmore; to command, 20.8.38. J. Coverdale, to No. 103 (B.) Squadron, Usworth; to command, 22.8.38. J. W. Homer, to H.Q., No. 11 (Fighter) Group, Uxbridge; for Air Staff (Armament) duties, 20.8.38. J. W. Lissett, to H.Q., Training Command, Market Drayton; for Armament duties, 20.8.38. W. J. Millen, to Recruits Sub-Depot, Upwood; to command, 22.8.38. E. S. Moulton-Barrett, to No. 204 (G.R.) Squadron, Mount Batten; for Flying duties, 22.8.38. E. C. Passmore, to H.Q., No. 12 (Fighter) Group, Hucknall; for Signals Staff duties, 22.8.38.

Flight Lieutenants.—R. E. Barnett, M.B.E., to Aeroplane and Armament Experimental Establishment, Martlesham Heath, 16.8.38. G. R. Brice, to H.Q., No. 16 (Reconnaissance) Group, Lee-on-the-Solent; for Air Staff duties, 2.8.38. F. W. Dixon-Wright, to H.Q., No. 25 (Armament) Group, Eastchurch; for Air Staff (Armament) duties, 22.8.38. A. D. Grace, to No. 1 R.A.F. Depot, Uxbridge, 28.7.38. W. F. C. Hobson, to No. 6 Armament Training Station, Warmwell, 16.8.38. N. C. Jones, to Directorate of Repair and Maintenance, Air Ministry, 15.8.38. P. H. R. Saunders, to School of Naval Co-operation, Ford, 14.8.38.

Medical Branch

Group Captain.—E. A. Lumley, M.C., to H.Q., R.A.F., Aden, 17.8.38; for duty as Principal Medical Officer and Commanding Officer, R.A.F. Hospital.

Wing Commander.—G. T. O'Neill, O.B.E., to No. 2 School of Technical Training (Apprentices), Cosford, for duty as Medical Officer, 22.8.38.

Flight Lieutenants.—R. A. Cumming, to R.A.F. Station, Leuchars, 15.8.38. F. H. Peterson, to R.A.F. Station, Eastchurch, 15.8.38. A. Sheehan, to No. 7 Armament Training Station, Acklington, 26.8.38.

Dental Branch

Flight Lieutenants.—A. C. Wilkie, to R.A.F. Station, Finningley, 24.8.38. A. J. S. Wilson, to R.A.F. Station, Leuchars, 26.8.38.

Accountant Branch

Wing Commander.—F. W. Arthurton, to R.A.F. Station, Eastchurch, 15.7.38; for Accountant duties.

Squadron Leader.—W. J. Heneghan, to Aeroplane and Armament Experimental Establishment, Martlesham Heath, 6.8.38; for Accountant duties.

Flight Lieutenant.—H. J. Titherington, to R.A.F. Station, Wyton, 13.8.38.

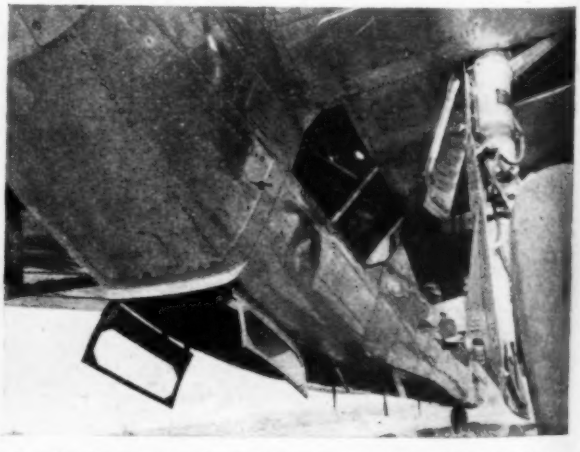
Chaplains Branch

Rev. N. F. Porter, to No. 2 School of Technical Training (Apprentices), Cosford, 4.8.38; for duty as Chaplain (C. of E.). Rev. V. S. Dodson, to No. 1 R.A.F. Depot, Uxbridge, 36.7.38; on appointment to a S.S.C. as Chaplain (C. of E.). Rev. J. Done, to No. 1, R.A.F. Depot, Uxbridge, 5.8.38; on appointment to a S.S.C. as Chaplain (R.C.). Rev. C. Y. McGlashan, to R.A.F. Station, Halton, 2.8.38; on appointment to a S.S.C. as Chaplain (Presbyterian).

Rev. C. W. A. Noble, to R.A.F. Station, Old Sarum; for duty as Chaplain (C. of E.), 22.8.38. Rev. C. S. J. Haskins, to No. 1 R.A.F. Depot, Uxbridge; for duty as Chaplain (Methodist), 8.8.38. Rev. S. W. Betts, to R.A.F. Station, Hendon; for duty as Chaplain (C. of E.), 12.8.38.

Owing to the greatly increased length of these lists, as a result of R.A.F. expansion, ranks are confined to those of Flight Lieutenant and above.

FOR OBSERVATION in COMFORT



Counterpart of our Westland Lysander, the North American O-47A three-seater observation (army co-operation) machine is now equipping units of American National Guard. With a Cyclone engine the machine has a top speed of 240 m.p.h. and a range of 1,000 miles. Two machine guns are carried. The observer's compartment consists of an upper and lower section, the upper being devoted almost entirely to radio installations, with their controls, and a set of instruments. The seat folds down to form a head-rest for the lower, or photographic, compartment where a camera is mounted vertically over double doors in the bottom of the machine. Oblique photographs may be taken through observation windows on each side.

COMMERCIAL AVIATION

AFTER DARK: An impressive night picture of the Jersey Airport building with one of Jersey Airways' D.H.86s in the foreground. Last month this company carried 8,015 passengers in and out of the airport

NEWS of the week? Well, there was the Paddy-minded greyhound which, bound from Dublin to London in the freight compartment of the Irish service, passed the time by carefully removing the bars of his crate, what time passengers reported to the pilot strange noises down aft. A landing at Bristol further revealed that mere bars were nothing to this Irish terror, for he had also eaten a neat hole in the fabric of the freight compartment door! It is understood that this playful passenger concluded his journey by land.

THE WEEK AT CROYDON

"A. Viator's" Locum Tenens Discusses a Canine Rodent, Waterspouts, Wind-socks and the Exciting Business of Riding in Airline Coaches

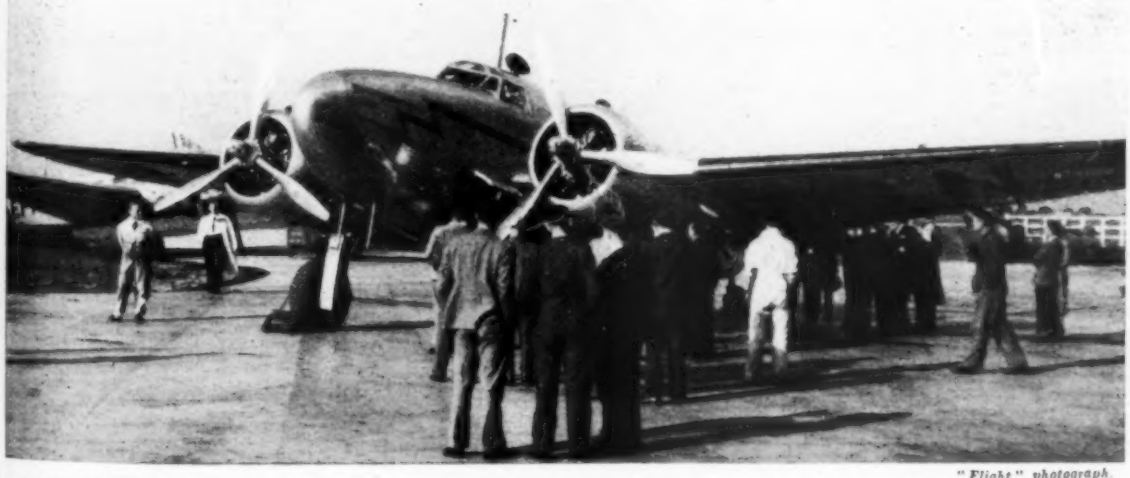
Then Mr. Duggan, on Thursday, encountered waterspouts—most unusually interesting phenomena—when bringing back the Wrightways freighter from Paris; so that inconvenience to other air liners might be avoided, he promptly radioed the Croydon control of their whereabouts.

Brains are apparently behind the lily-white chastity of our new wind-sock; it is weighty but limp, and so in daytime we have had to revise our ideas of wind-strength compared with the mustard variety which it replaced. The weights are revealed at dusk to be internal illuminations which give it the appearance of a mating glow-worm—very effective.

I am told that Swissair transported £2 million Swiss bonds here last week, and notable passengers included Mr. Kennedy, U.S. Ambassador, by Air France from Cannes and Signor Grandi and son by Imperials from Paris. Sheffield Corporation combined business with pleasure when they chose K.L.M. to visit Holland to study the engineering problems of the canal system. A change from the usual study of tulips.

Croydon, of course, does not exactly welcome private owners, though visiting pilots from foreign parts make their entry to this country by way of its undulations, and through our inhospitably directionless passages as they plough through the several formalities. They presumably imagine—speaking in terms of convenience—that Croydon and London are synonymous until they encounter the problem of getting to the real part of the City from our terminal airport.

True, there are the hire cars, the "194-to-East-Croydon-station," "trains-every-ten-minutes-to-Victoria," and the half-hourly Green Line coach which passes our portals, but when you are fresh from the inquisition of officialdom and burdened with baggage, every currency except English, and not even a smattering of our language, these divers forms of transport remain a myth. So here it is that the traffic superintendents of our visitors' national airline com-



"Flight" photograph.

ONE OF FOUR: Airwork and general interest in British Airways' first Lockheed 14, which was flown up to Heston from Southampton, where it was assembled, last Saturday. The cleanliness of the Hamilton hydromatic airscrew hubs is noteworthy. The British Airways' 14s have several non-standard features.

panies so frequently adopt the role of Official Welcomer in locating spare seats (if any) on their company's various coaches.

On July 30, K.L.M. carried 1,076 passengers on European and inland services in Holland. It was the first time, I believe, that the company has clocked up over a thousand travellers in a day. Of these 576 were inland travellers, which is interesting, for, after all, Holland is a small country and one in which inland flying might, one would suppose, be much less prosperous than it is in this country.

Actually it is flourishing, because the Dutch are thoroughly air-minded and because distances take a long time to cover by train or road. Routes are far from straight lines from point to point on the ground because of the way the country is networked with waterways. Thus it pays to fly quite short distances.

The Director of Publications dropped me a postcard regarding my subscription to the Air Pilot Supplements one day recently. He referred to them, not without levity, I thought, as "Air Pilots' Supps." Brevity being the soul of wit, especially in this case, should he not have headed his esteemed communication "Director of Pubs. —Air Pilots' Supps."? TARMAC.

The First Fourteen

AFTER a little less than a week of assembly work at Southampton the first of the British Airways' Lockheed 14s was flown up to the company's operational headquarters at Heston last Saturday afternoon. The pilot was Mr. E. G. Robinson and the co-pilot Mr. A. R. O. McMillan, the company's chief instructor. Mr. A. C. Campbell Orde, the operations manager, and R. A. Hall, the development engineer, were also in the machine on this delivery trip.

Although we were not able to inspect the interior arrangements while the machine was at Heston, it is obvious even from outside inspection that various useful modifications have been made to the standard model. There is, for instance, as in the case of the Electras, a separate compartment for the wireless operator and his equipment, and the pilot's cabin has a partially transparent roof designed so that the machine may not be entirely blind during turns.

The British Airways' machines are the first to be put into service in Europe with Hamilton full-feathering hydromatic airscrews. The engines are Cyclone F.62s, which give a take-off power of 900 b.h.p. at 2,350 r.p.m. The maximum emergency power for protracted use is 810 b.h.p., and this can be maintained up to a height of 6,600ft. With these engines, and using 550 b.h.p. from each, the cruising speed at 13,000ft. is 228 m.p.h. The range with normal maximum fuel at this power and altitude is nearly 1,300 miles.

These machines will be used on the non-stop London-Lisbon service which will form the first stage of the company's air route to West Africa and South America. Unofficially, with four machines on which to draw, it seems possible that the company will also use one or more from time to time on the Paris and Stockholm runs. For the latter, when bad weather makes it necessary to cut out one of the stops or to make a return, say, to Stockholm on the homeward trip (after both Copenhagen and Hamburg have closed down), the standard range of the Fourteen would be extremely useful.

No Collusion

ALLIED AIRWAYS and Scottish Airways have so far failed to come to an agreement whereby each would operate the Shetland service on alternate days. Allied Airways carry the mails on Tuesdays, Thursdays and Saturdays, and they suggested that Scottish Airways might make the trip on the remaining days of the week. Scottish Airways, however, explain that they cannot alter their schedule of runs on Tuesdays, Wednesdays, Thursdays and Saturdays. So quite a lot of fuel and seats will be wasted.

The "Lieutenant" Gets There

ON Wednesday of last week the Latécoère boat, *Lieutenant de Vaisseau Paris*, arrived at Port Washington, New York, after a non-stop flight of 2,400 miles from Horta, in the Azores. The *Lieutenant* left Bordeaux a fortnight ago on an easy experimental flight to study the conditions on the Atlantic route which Air-France Atlantique propose to use. The distance from Horta was covered in a little less than 23 hours.

New York's Airport

APPARENTLY the question of whether the new North Beach land-sea airport, which is at present under construction in Long Island Sound, should displace Newark Airport as New York's terminus has finally been settled. The City authorities have won the tustle and next spring at least five major operating companies will be using the new terminus, which is only twenty minutes by car from the centre of Manhattan. It is probable that Pan-American Airways' Atlantic base will be permanently established there, though presumably, because of ice difficulties, there will be a temporary transfer of activities to Baltimore each winter.

Holiday Statistics

TRAFFIC figures appear to have settled down on the majority of holiday and similar internal air routes. Some figures which have recently been issued by Jersey Airways tend to suggest that little change may now be expected, though the use of more matter-of-fact services should automatically increase year by year as prospective passengers become more accustomed to flying as a means of travel.

The Jersey Airways figures compare a typical holiday week that ended on August 27 this year—with the corresponding week of 1937. The total number of passengers, both inwards and outwards, show quite a fair increase on the London-Jersey service (482 against 467) and a decrease on the Alderney-Jersey run (34 against 63). The most popular service, that between Southampton and Jersey, carried 1,049 passengers against last year's 1,101, but this reduction is more than balanced by the figure for the Portsmouth-Jersey service, which was restarted this year. This shows that many of last year's passengers to and from Southampton found it more convenient to use Portsmouth as a stepping-off point.

Altogether, the services carried 98 more passengers this year —excluding the new Dinard service which is operated in pool with Air-France. Eighty-two passengers were carried during the same week on this service.

OUT AGAIN: The big Boeing flying boat designed for the Atlantic service is now out again for tests with its redesigned tail unit. It will be remembered that during the initial tests the directional surfaces were found to be inadequate. Presumably the sponsons have also been modified, since the machine's stability in the water was not a strong point during taxying trials.

COMMERCIAL AVIATION (CONTINUED) : WORLD NEWS

THE LATEST DORNIER : When compared with the similar view overleaf, this photograph of the new Dornier Do.26 is particularly interesting. In this case the outboard floats are retracted and the machine is running on the step at a speed high enough for lateral control to be available. The Do.26 is designed for catapult work.

Hong Kong Included

AS an extension of the air-mail arrangements for Empire destinations, all first-class mail for Hong Kong is now being despatched by air in the ordinary course of events at the usual flat rate. There are two services from this country every week, though for the present it cannot be guaranteed that every letter will travel through by the next "sailing."

More Lockheeds for Europe

THE last of a fleet of four Lockheed 14s have now been delivered to the Rumanian operating company, Liniile Aeriene Romane Exploatate Cu Statul (L.A.R.E.S.). These machines are fitted with Wright Cyclone engines and are arranged to carry eleven passengers with a crew of three.

Early next year the Yugoslavian company, Societe de Navigation Aerienne Yougoslave (S.N.A.Y.), will take delivery of two more Electras. Their first two went into service in April last year, and three more were delivered at Belgrade early this year. The new machines will be put on the Belgrade-Vienna run.

South American Extensions

THE Argentine Government has now granted permission to the Corporacion Sudamericana de Servicios Aereos for the operation of their projected passenger service between Rosario de Santa Fé, Buenos Aires and Montevideo. This permission is given on condition that at least two flights are made every day between Rosario and Buenos Aires and one per day between Buenos Aires and Montevideo.

In Brazil the Aero-Lloyd Iguassu Company has now started a service from the provincial capital of Curityba to Jacarezhinho, and this service will be experimentally extended to the northern part of the state in due course.

Directional Simplification

IN January of this year the Air Ministry, no doubt thinking of the large number of Service machines which would be about the sky in all weather conditions, instituted a "directional system" which was designed to prevent, as far as possible, collisions in conditions of bad visibility.

Briefly, this system was intended to ensure that all machines flying at a particular height would be on the same course. On a course, for instance, of 320 degrees M. the pilot has, in conditions when the horizontal visibility is less than 1,100 yd., to fly at one of four heights—6,200ft., 10,200ft., 14,200ft., and 18,200ft.—except when climbing or descending.

At the same time, the Air Ministry produced a special course-height indicator card on which these different courses and heights were given.

Intava have now produced a special indicator for use with the directional system, and this indicator makes the whole business very much simpler. It consists of two circular cards, rotatable in relation to one another, the upper one of which has two windows. In one of these the desired magnetic course is seen, and in the other is seen the alternative heights of flight. It is only necessary to rotate the upper disc until the course is shown in the appropriate window and the heights can be read off at once in the other.

Abbotsinch for Glasgow?

IT appears that the R.A.F. aerodrome at Abbotsinch may be taken over by the Glasgow Corporation as a municipal airport. This aerodrome, which is one of the best in Scotland, is only a mile or so farther out than Renfrew. The present runs vary from 1,200 to 800 yards.

New Near East Service

LAST Sunday (September 4) Air France put into operation a new service between Marseilles and Tripoli (Syria). This service, which will be run weekly in both directions on Sundays, has been introduced specially for travellers to and from such places as Aleppo, Baghdad, Cairo, and so forth, which towns are linked up with Tripoli by road, rail, river, sea or air connections.

The new service will relieve the pressure of traffic on the Near Eastern section of the company's long-distance trunk route to the Orient which, since August 3, has been extended from Hanoi, in French Indo-China, right through to Hong Kong.

New Equipment for Ratmalana

A VERY real effort is now being made for permission and resources to provide both night-flying equipment and direction-finding facilities for Ratmalana aerodrome in Ceylon. Such equipment is very necessary for the Tata mail services, and it appears that a K.L.M. official who recently visited Ceylon criticised the aerodrome severely on both these counts and on the fact that it was much too small. The need, also, for an emergency landing ground in Ceylon has long been obvious, and a site will shortly be selected near Jaffna, in North Ceylon.

Last year a proposal was made to construct an artificial lake beside the aerodrome for the use of flying-boats, but it now seems that Bolgoda Lake, which is only two miles from the aerodrome, will eventually be used.

Australian Additions

DURING the past few months three new air transport companies have been registered in Australia. The first will be known as Safety Airways and is being formed by Mr. S. F. Doyle, who is associated with the Australian Airspeed agents, Airplane Construction Development. Using D.H. Rapide seaplanes which have been ordered from the De Havilland Canadian subsidiary, this company will run four or more services a day between Rose Bay (the Sydney terminus of Imperial Airways) and Newcastle.

Road transport interests are concerned with another company, known as Inland Airways, which, using Airspeed Envoys, proposes to run a service between Melbourne and Brisbane over a route which has not previously been exploited. Midwest Airline is the third company, and is expected to run a daily return service between Sydney, Bathurst, Orange, Parkes and Forbes.

Additionally, a company which is known as Southern Queensland Airways may shortly be importing two D.H. Rapides for a service between Brisbane and Toowoomba. The man behind the concern already operates a road transport service between these points

Commercial Aviation

A REMARKABLE DORNIER BOAT

Four Diesel Engines in Two Tandem Pairs : Sponsons Replaced by Retractable Floats

A NEW contribution to the team of German aircraft available for North Atlantic service has been made by the Dornier four-engined flying boat demonstrated on the Müggelsee in Berlin last week. The machine will be operated by Lufthansa. Marked refinement in design is evidence in the interests of performance and range. The top speed is 208 m.p.h. and maximum cruising speed 192 m.p.h. ; the cruising radius is 5,600 miles.

A gull-wing layout has been adopted, and the engines are arranged tandem fashion in two pairs as in our Short Singapore. The lateral sponsons which for so long have characterised the Dornier flying boats have been eliminated and replaced by floats which are laterally retractable into the wing.

Despite her size the new boat may be launched by catapult and could, under these conditions, carry four passengers and a ton of mails non-stop from Lisbon to New York.

Designed expressly for the North Atlantic service, the latest four-engined Dornier flying boat, the gull-winged Do. 26, incorporates many unusual features. Lateral sponsons, characteristic of Dornier boats, have been replaced by retractable wing floats.

The wing itself is of trapezoidal shape with rounded tips, and is built in three portions, the centre one being the V-shaped centre section built integral with the hull. Apparently the double wing arrangement has been dropped and the flaps seem quite normal.

The hull is of the two-step type and is divided into eight water-tight compartments. Aft of the mooring compartment in the bow is a hold for mail and freight, followed by accommodation for a crew of four, the wireless and navigation rooms and a second mail compartment.

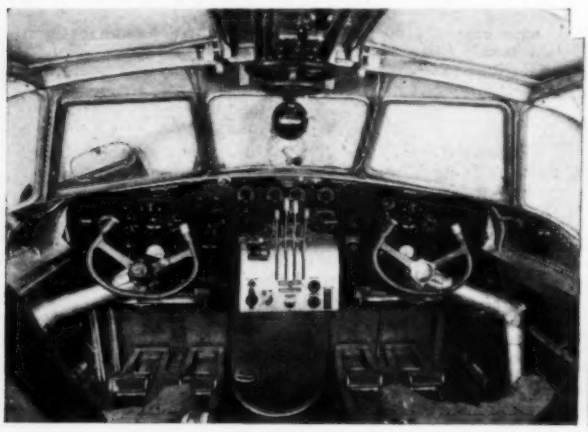
The tail unit has a single fin and rudder and a braced tailplane. The surfaces are balanced and are fitted with trimming tabs.

Four water-cooled Junkers Jumo 205 heavy-oil engines of 600 h.p. each are specified. The front airscrews are driven in the normal fashion, but to obtain good aerodynamic form and the necessary wing clearance the rear propellers have elongated shafts. A remarkable feature is the ability to raise the rear power plants through an arc of 10 degrees to protect the propellers from the spray during take-off.

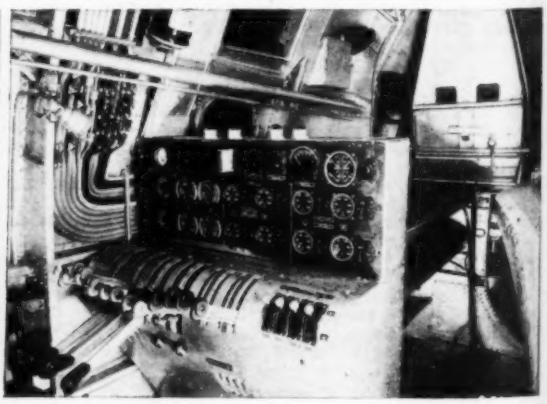
All fuel is carried in the hull, but there is still space for 80,000 letters.

It is claimed that demonstration flights have shown that the machine will fly on two engines. All four power units, incidentally, are accessible during flight. Data are:

Span	... 98ft. 5in.	Wing loading	... 32.91 lb./sq. ft.
Length ...	... 80ft. 4in.	Engine loading	... 18.29 lb./h.p.
Height ...	... 22ft. 5in.	Maximum speed	... 208 m.p.h.
Wing area ...	... 1,291.67 sq. ft.	Cruising speed	... 192 m.p.h.
Weight (empty)	... 22,487.20 lb.	Landing speed	... 68 m.p.h.
Useful load ...	... 21,605.30 lb.	Range	... 5,600 miles.
Total weight (catapult start)	... 44,092.40 lb.		



With a separate engineer's control panel, it has been possible to simplify the layout of the new Dornier's instrument board. Note the twist-grips on the spectacle controls and the accessibility of the D/F loop gear.



On the Dornier Do.26 the engineer sits aft, in front of a comprehensive instrument panel, thereby relieving the pilots of a good deal of instrument-watching and engine control adjustment. The engineer has access to all four engines.

CANADIAN CO-OPERATION

British Aircraft Production Mission's Announcement : Two New Factories to be Established

ARRANGEMENTS made by the British Air Mission to Canada were disclosed in this official statement issued by the Mission in Ottawa last Friday:—

"As a result of exhaustive discussions arrangements have been made by the United Kingdom Government in conjunction with the principal firms in the industry in Canada, supported by prominent financial organisations, for the placing of contracts for bomber aircraft for the United Kingdom on a long-range programme of purchases. Under the arrangements the aircraft firms will augment their existing capacity to manufacture mainly aircraft components, with two new central factories which they will build for this purpose, one at Montreal and one at Toronto.

Central Company

"A central company is to be formed in association with these firms which will operate the two main establishments and contract directly with the United Kingdom Government. Subject to approval of the arrangements by the United Kingdom Government the new company will be finally constituted and enter into contracts with that Government to cover the long-range purchase programme.

"The United Kingdom representatives are also discussing with the Canadian aircraft firms, subject to confirmation, arrangements for placing contracts for manufacture of other types of aircraft for the United Kingdom Government at other centres, e.g., Vancouver and Fort William. Such arrangements, which would be supplementary to those already obtaining under which a number of Canadian firms manufacture aircraft of British types for the Candian Government, would involve the erection of additional manufacturing plant by firms at those centres.

"These arrangements, as stipulated by the Canadian Government, in accordance with usual practice of Governments in a like situation, will preclude any possibility of prejudicing that Government's existing or future contracts with Canadian manufacturers for supplying needs of Canadian military forces. It was also the desire of the Canadian Government that all United Kingdom Government's contracts and all arrangements in that connection should be made directly between United Kingdom Government and Canadian firms. The United Kingdom Government accordingly have entire responsibility for placing of such contracts and all incidental arrangements. The Canadian Government have been duly informed of the progress made with the arrangement as here outlined."

The Mission has been in Canada for little more than a month. It is headed by Sir Hardman Lever, and consists of Marshal of the Royal Air Force Sir Edward L. Ellington, Mr. F. Handley Page and Mr. A. H. Self. Preliminary enquiries, it will be remembered, were made by an earlier mission which visited the United States and Canada in the spring of this year.

Something New from the States

SPECIALISTS in precision instrument work, an American firm known as Vard Mechanical Laboratory, is producing several items of interest to the aeronautical industry and aircraft operators, and their representative, Mr. Vard B. Wallace, has recently arrived in this country.

Among the processes in which they have specialised is metal-coating, by the evaporative process, of such components as astronomical telescope mirrors, and the knowledge thus gained has played a part in their more recent production of aircraft instruments, such as drift indicators.

The drift indicator described here allows the navigator to remain in his seat while taking a sight.

The drift indicator illustrated here is designed to allow the user to remain in his seat instead of having to get down to use a floor-type sight. The general arrangement is fairly obvious from the illustration; the drift-lines are contained at the junction of the eye-piece with the main body, a small dry-cell-fed light being provided to illuminate the lines for night work. At the elbow, above the rotation joint, is an aluminised mirror. The remainder of the instrument may be roughly described as being on periscope lines, with the exception that the lower prism may be inclined by a Bowden cable to follow a receding object, e.g., an aluminium-powder drift bomb dropped on the surface of the sea. One of these instruments was used by Howard Hughes on his recent world flight, and, actually, the original design was by Lt. Thurlow, one of Hughes' navigators.

Another instrument is a simple direct-vision bearing sight, or pelorus. Any form of telescope is dispensed with; instead an illuminated datum-cross is projected on a small glass, ground and polished plane-parallel, through which the sight is taken. The design is such that, within limits, the observer can move his head and still keep the cross on the field, thus giving him more freedom than would be the case with a telescope. A degree-scale forms part of the base.

Thirdly (and, actually constituting the major part of the firm's business) is the manufacture of drafting machines. Of a design departing radically from the orthodox double-parallelogram type, and of high precision in construction, these range from large counterbalanced types for use on design-office boards to small fitments for aircraft chart boards. It is stated that the Lockheed, Douglas and Worthrop drawing offices make extensive use of these machines.

Details are obtainable from Mr. Wallace, at 38, Torrington Square, London, W.C.1. (Museum, 0938.)

C.A.G. and A.D.C.C.

IT seems that questions have been asked as to whether the recently formed Air Defence Cadet Corps and the Civil Air Guard trespass on each other's territory, for in a letter from the Secretary of State for Air to Sir John Salmond (chairman of the A.D.C.C.), recently made public, the following declarations appear:—

"I am very glad to hear that you are devoting your energies to the organisation of the Air Defence Cadet Corps.

"The Royal Air Force Volunteer Reserve and the Civil Air Guard each have their function; the one provides a trained reserve of young men who will carry out active service in the Royal Air Force in time of war, and the other, composed both of men and women from 18 to 50, will perform in war the most valuable task in lessening the burden of day-to-day duties falling on the fighting services

"But neither of these lessen the need for such a body as the Air Defence Cadet Corps. By giving youths between the ages of 14 and 18 opportunities for technical training and direct contact with aviation, the Corps will ensure a steady flow into the Royal Air Force and the Auxiliary Air Force, and the two organisations I have mentioned, and will also perform a most important service to civil aviation in this country by familiarising young men with all aspects of aviation, making them air-minded in the best sense of the term."

THE INDUSTRY

Sqn. Ldr. England's New Post

"AVIATION TECHNICAL SALES ADVISER" is the official title of the new post just taken up by Sqn. Ldr. T. H. England with Guest, Keen and Nettlefolds, Ltd., of Birmingham. Sqn. Ldr. England relinquished his post with the Austin company a few days ago. At the Austin shadow factory he was in charge of flight testing. In his new job he will have excellent opportunities for studying directions in which the production facilities of Nettlefolds can best serve the aircraft industry.

Mr. Harry Milnes

MR. HARRY MILNES, who has been general manager of Modern Machine Tools, Ltd. (Butts Works, Coventry), has been appointed a director of the company.

Mr. Milnes was in the Royal Air Force during the War, and was subsequently, for some fourteen years, with the Blackburn company, first at Leeds and later at Brough.

Aluminium Tubing

ALUMINIUM Tubes and Pipes is the title of the latest data booklet issued by the British Aluminium Co., Ltd., Adelaide House, King William Street, London, E.C.4.

A.R.P. Illustrated

SOME instructive and well-illustrated details of air raid precaution and air defence measures are given in a new series of 50 cigarette cards now being issued by W. D. and H. O. Wills with their Gold Flake, Capstan, Woodbine, and Star cigarettes.

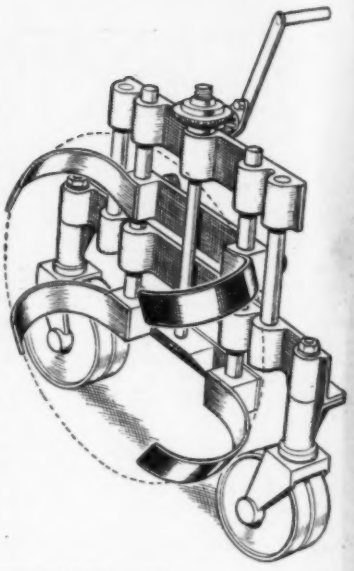
Alloy Data

A NEW set of loose-leaf data sheets, covering their wide range of light alloy extruded sections, has been issued by Reynolds Tube Co., Ltd., Hay Hall Works, Tyseley, Birmingham. The introductory pages have been entirely rewritten and the new matter includes the recently introduced Hiduminium R.R.77 and Hiduminium 45 alloys, while there are additional data on, and illustrations of, manipulated sections. Those interested may obtain copies from the Aluminium Alloy Department of the company.

Starting the Dagger VIII

IN a recent description of the improved Napier Dagger Series VIII engine, which has successfully passed its 100-hour type test, it was suggested that an electrically energised inertia starter is employed. In actual fact a Rotax Eclipse direct-cranking starter (Type E.160C.) is standardised. It will be remembered that the Eclipse direct-cranking starter is also fitted with means for turning the engine over by hand. This type of starting motor, which is standardised on Bristol Pegasus and Mercury engines, is being produced in considerable quantities at the Rotax Works at Willesden.

A MERRYWEATHER CRASH TENDER and fire engine ordered for use at the Austin shadow factory. Its equipment includes a 1,000-gallon "Xaust-Suds" foam generator, a 4,000 cu. ft. battery of "Karbono" CO_2 cylinders, hand extinguishers, and complete rescue equipment.



FOR HANGAR OR FACTORY: Having solved the problem of moving parked cars bodily sideways by means of "jacking skates," Harvey Frost and Co., Ltd., Bishop's Stortford, have adapted the same ingenious devices for aircraft use. The sketch is self-explanatory: the dotted lines indicate the aircraft wheels, lifted clear of the ground by a turn of the handle. The casters are divided to give a differential action.

NEW COMPANIES

In the notes below, for reasons of space, the "objects" of new companies are usually somewhat abbreviated.

AIRCRAFT INVENTIONS LTD.—Private company, registered August 15. Capital, £1,000 in 1,000 shares of £1. Objects: To acquire any patents relating to aeronautical construction and engineering, to manufacture and deal in aerial conveyances and aircraft, etc. Subscribers: Ralph Lane and William E. Shawyer. Solicitors: Wm. Easton and Sons, 43, London Wall, London, E.C.2.

BLACKPOOL AND FYLDE AERO CLUB, LTD.—Private company, registered August 10. Capital, £1,000 in 500 ordinary and 500 preference shares of £1 each. Dividends are limited to 5 per cent. and any surplus profits are to be applied for the benefit of the Club. Objects: To carry on the business of carriers of passengers, goods and mails by air, land or water; to manufacture and deal in aircraft; to instruct in aviation; to carry on proprietorship of a club, aerodromes, etc. Directors: A. Talbot, L. W. Walsh and E. J. Lawn. The registered office is at 8, Edward Street, Blackpool.

ODDIE LOCK NUTS LTD.—Private company, registered August 18. Capital, £5,000 in £1 shares (500 ordinary and 4,500 6 per cent. cumulative participating preference). Objects: To acquire from F. A. Oddie the patent rights in respect of a lock nut devised by him and to carry on the business of founders, engineers, etc. Directors: F. A. Oddie, F. Woolley and others. Registered office: 10, Portland Terrace, Southampton.

DAVIDSON AIRCRAFT LTD.—Private company, registered August 19. Capital, £100 in 100 shares of £1 each. Objects: To carry on the business of manufacturers and dealers in aircraft, parachutes and gliding machines. Subscribers: W. F. Davison and J. Turner. Address: Merseyside Air Park, Hooton, Cheshire.

LAYSTALL ENGINEERING CO., LTD.—Private company, registered August 11. Capital, £100 in 500 ordinary shares of 4s. each. Objects: to acquire the business, undertaking and assets of the Laystall Motor Engineering Works Ltd. and to carry on the business of die-casters, makers and sinkers, manufacturers of, dealers in and agents for pistons, piston rings, valves, valve seats, cylinder liners, casting, etc. Subscribers: F. H. Morley and A. T. Pelling. Registered office: Laystall House, Ewer Street, London, S.E.1.

INTERNATIONAL CORRODELESS, LTD., was registered on August 26 as a private company, with a nominal capital of £50,000. Objects: to carry on the business of workers in all kinds of metals, alloys, and other materials and articles for their preservation, especially from corrosion or rust. Solicitors: J. D. Langton and Passmore, 16, Tokenhouse Yard, London, E.C.2.

INCREASES OF CAPITAL

AIRCRAFT PRECISION LTD. (284, Western Road, London S.W.19).—The nominal capital has been increased by the addition of £200 in £1 ordinary shares beyond the registered capital of £1,000.

AIRSCREW COMPANY LTD. (Weybridge, Surrey).—The nominal capital has been increased by the addition of £45,000 beyond the registered capital of £175,000. The additional capital is divided into 450,000 ordinary shares of 2s. each.

MORRISONS ENGINEERING LTD. (1, Croydon Factory Estate, Purley Way, Croydon).—The nominal capital has been increased by the addition of £3,000 in £1 ordinary shares beyond the registered capital of £3,000.

AERONAUTICAL PATENT SPECIFICATIONS.

(*Published September* 1, 1938.)

13855. HAWKER AIRCRAFT LTD., and BOWER, C.: Cabin tops, cupolas and the like for aircraft (489,703).

27627. SHORT BROS. (ROCHESTER AND BEDFORD), LTD., and GOUGE, A.: Bomb carrying and dropping apparatus for use on aircraft (490,028).

367. HAWKER AIRCRAFT, LTD., and BOWER, C.: Cabin tops and the like for aircraft (489,837).

(*Published September* 8, 1938.)

401. BETTINGTON, E. M., and AVIATION DEVELOPMENTS, LTD.; Tubular rivets and their manufacture (490,047).

3586. MARJERAM, A. E.: Launching and landing device for aircraft (490,214).

3989. UNITED AIRCRAFT CORPORATION: Aeroplane-wing flaps and multiposition actuating mechanism therefor (490,419).

3991. NEGRETTI, H. N., and NEGRETTI, P. E.: Mounting of instruments (490,420).

9013. HUNTER, R. (Patin, A.): Electric transmitters for use in course-indicating or control systems for air or water craft (490,313).

12467. BAYERISCHE FLUGZEUGWERKE AKT.-GES: Folding wings for aeroplanes (490,151).

13524. MERCIER, J.: Retractable undercarriages for aeroplanes (490,087).

14303. EVANS, A. F., HOPKINS, S., and HIGH-PRESSURE AIRCREWS LTD.: Variable-pitch airscrews (490,402).

21740. SHEVLIN, J. T. (Siemens Apparate und Maschinen Ges.): Course instrument for vehicles, in particular aircraft (490,162).

23841. COURTNEY, F. T.: Apparatus for aeroplane launching (490,408)

24998. LORENZ AKT.-GES., C.: Measuring phase and/or frequency modulation of alternating currents (490,332).

26288. RATIE, P. J. P.: Machines for manufacturing propeller blades by copying (490,410).